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# 2003 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks.

# Mise à jour du relevé de l'été 2003 sur les poissons de fond pour des stocks particuliers du plateau néo-écossais / baie de Fundy.

R. Branton and/et G. Black

Department of Fisheries and Oceans
Maritimes Region, Science Branch
Bedford Institute of Oceanography
1 Challenger Drive, Dartmouth
Nova Scotia, B2Y 4A2
Canada

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104-06234/




## Abstract

A synopsis of the results of the 2003 DFO summer bottom trawl survey on the Scotian Shelf and Bay of Fundy is provided. Survey trends for each stock from 1970 to present are shown as a series of graphs and expanding symbol maps. This information is used in assessment meetings as a key source of information on trends for selected groundfish stocks.

## Résumé

Un résumé des résultats du relevé au chalut de fond qui a été effectué pendant l'été de 2003 par le Ministère des Pêches et des Océans dans les eaux du plateau néo-écossais et de la baie de Fundy est présenté. Les tendances pour chaque stock dans les relevés de 1970 jusqu'à aujourd'hui sont présentées sous forme d'une série de graphiques et de cartes de distribution. Ces résultats sont utilisés lors de réunions d'évaluation comme principale source d'information sur les tendances des stocks de poisson de fond sélectionnés.

# INTRODUCTION

## Introduction

The annual groundfish bottom trawl survey was conducted by DFO on the Scotian Shelf and Bay of Fundy as planned 2 July to 30 July. The results of this survey were compiled for selected stocks to provide clients with a preliminary view of biomass, abundance, resource concentration, area occupied, size composition, and distribution as determined by the survey. The groundfish stocks covered by the report and the lead scientific investigator are listed in Table 1. The distribution of sampling effort compared with the past three years is shown in Figures 1 to 4. Survey trends for each stock from 1970 to present are shown in Figures 5 to 112. Mean weight and number caught per tow and long term frequency distribution time series are not adjusted for the research vessel and survey gear changes which occurred in 1982-3. Fanning (1985) reported vessel conversion factors from comparative fishing experiments, which are large for some species.

Branton and Black (1999, 2000, 2001, 2002) reported similar results for the 1999 - 2002 surveys. This document includes the resource concentration, prevalence, and CPUE where present indicators which measure demersal fish population distribution (Halliday, 2001). In contrast to previous reports, the estimate of resource concentration is calculated as the stratified area occupied of the non-zero catch sets. An estimate of resource prevalence is the proportion of sets containing the species of interest. This provides an indication of how widely the species is distributed within the survey area without reference to density. A third distribution index, CPUE where present, is the average of the log (non-zero catches) and is indicative of the average local density.

Comprehensive interpretations of stock status are contained in stock assessment documents prepared annually for many of the stocks described here (http://www.dfo-mpo.gc.ca/csas/). Such reports contain information on commercial fishery catch rates and other survey results when available. Therefore, the abundance trends reported here, based on the survey information only, are not directly comparable to those provided in recent assessments.

## Survey Description

The 33rd annual Scotian Shelf groundfish survey was conducted from the research vessel CSS *Alfred Needler* out of the Bedford Institute of Oceanography, Dartmouth, N.S., on two trips N2003036 (2-17 July 2003) and N2003042 (21 July - 30 July 2003). The survey was conducted using the standard protocol (Koeller, 1981). Two hundred and thirty one fishing stations, from the Upper Bay of Fundy to the northern tip of Cape Breton and offshore to the 400 fathom contour, were completed.

Samples were obtained with a Western IIA bottom trawl towed for 30 minutes at a speed of 3.5 knots. The trawl has a 106 foot roller-rigged footrope and 2000 pound Portuguese doors. The codend is lined with 3/4 inch mesh to retain small fish. All finfish caught were sampled for length and weight and some species were sampled additionally for otoliths to determine age, for evidence of sexual maturity and for stomach contents. Vertical profiles of temperature, salinity, nutrients and oxygen were observed at all fishing stations.

## References

Branton, R. and J. Black. 1999. 1999 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 99/151. 60p.

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Fanning, L.P. 1985. Intercalibration of research vessel survey results obtained by different vessels. CAFSAC Res. Doc. 85/3: 43p.

Halliday, R.G. 2001. Proceedings of the Fisheries Management Studies Working Group (15-16 and 31 May 2001). CSAS Proc. Ser. 2001/21. 82p.

Koeller, P. 1981. Manual for groundfish survey personnel - cruise preparation, conduct and standing orders. DFO Marine Fish Division Laboratory Reference No. 81/3.

Table 1. Stock name, figure list, page list, as well as name, telephone number and email address of the lead investigator for groundfish stocks observed on 2003 summer bottom trawl survey.

| Stock | Figures | Pages | Investigator | Telephone | E-mail |
|---|---|---|---|---|---|
| **4Vn Cod** | 5 - 8 | 9-10 | Showell | (902) 426-3501 | ShowellM@mar.dfo-mpo.gc.ca |
| **4VsW Cod*** | 9 - 12 | 11-12 | Fanning | (902) 426-3190 | FanningP@mar.dfo-mpo.gc.ca |
| **4X Cod*** | 13 - 16 | 13-14 | Clark | (506) 529-8854 | ClarkD@mar.dfo-mpo.gc.ca |
| **4VW Haddock** | 17 - 20 | 15-16 | Mohn | (902) 426-4592 | MohnR@mar.dfo-mpo.gc.ca |
| **4X Haddock*** | 21 - 24 | 17-18 | Hurley | (902) 426-3520 | HurleyP@mar.dfo-mpo.gc.ca |
| **4VWX Pollock** | 25 - 28 | 19-20 | Neilson | (506) 529-8854 | NeilsonJ@mar.dfo-mpo.gc.ca |
| **Unit 3 Redfish** | 29 - 32 | 21-22 | Branton | (902) 426-3537 | BrantonB@mar.dfo-mpo.gc.ca |
| **4VW Plaice** | 33 - 36 | 23-24 | Fowler | (902) 426-3529 | FowlerM@mar.dfo-mpo.gc.ca |
| **4VW Yellowtail** | 37 - 40 | 25-26 | Fowler | (902) 426-3529 | FowlerM@mar.dfo-mpo.gc.ca |
| **4VW Witch** | 41 - 44 | 27-28 | McRuer | (902) 426-3585 | McRuerJ@mar.dfo-mpo.gc.ca |
| **4VW Winter Flounder** | 45 - 48 | 29-30 | Fowler | (902) 426-3529 | Fowler@mar.dfo-mpo.gc.ca |
| **4X Plaice** | 49 - 52 | 31-32 | Fowler | (902) 426-3316 | Fowler@mar.dfo-mpo.gc.ca |
| **4X Yellowtail** | 53 - 58 | 33-34 | Fowler | (902) 426-3529 | Fowler@mar.dfo-mpo.gc.ca |
| **4X Witch** | 57 - 60 | 35-36 | McRuer | (902) 426-3585 | McruerJ@mar.dfo-mpo.gc.ca |
| **4X Winter Flounder** | 61 - 64 | 37-38 | Fowler | (902) 426-3529 | FowlerM@mar.dfo-mpo.gc.ca |
| **4VWX Halibut** | 65 - 68 | 39-40 | Zwanenburg | (902) 426-3310 | ZwanenburgK@mar.dfo-mpo.gc.ca |

| Stock | Figures | Pages | Investigator | Telephone | E-mail |
|---|---|---|---|---|---|
| **4VWX Silver Hake*** | 69 - 72 | 41-42 | Showell | (902) 426-3501 | ShowellM@mar.dfo-mpo.gc.ca |
| **4VsW Winter Skate** | 73 - 76 | 43-44 | Simon | (902) 426-4136 | SimonJ@mar.dfo-mpo.gc.ca |
| **4VWX Monkfish** | 77 - 80 | 45-46 | Beanlands | (902) 426-3515 | BeanlandsD@mar.dfo-mpo.gc.ca |
| **4VW White Hake** | 81 - 84 | 47-48 | Bundy | (902) 426-8353 | BundyA@mar.dfo-mpo.gc.ca |
| **4X White Hake** | 85 - 88 | 49-50 | Bundy | (902) 426-8353 | BundyA@mar.dfo-mpo.gc.ca |
| **4VWX Wolffish** | 89-92 | 51-52 | McRuer | (902) 426-3310 | McruerJ@mar.dfo-mpo.gc.ca |
| **4VWX Cusk** | 93-96 | 53-54 | Comeau | (902) 426-5418 | ComeauP@mar.dfo-mpo.gc.ca |
| **4VW Lumpfish** | 97-100 | 55-56 | Wilson | (902) 426-3318 | WilsonS@mar.dfo-mpo.gc.ca |
| **4X Lumpfish** | 101-104 | 57-58 | Wilson | (902) 426-3318 | WilsonS@mar.dfo-mpo.gc.ca |
| **4VW Turbot** | 105-108 | 59-60 | Stobo | (902) 426-3316 | StoboW@mar.dfo-mpo.gc.ca |
| **4VWX Spiny Dogfish** | 109-112 | 61-62 | Campana | (902) 426-3233 | CampanaS@dfo-mpo.gc.ca |

* was assessed in 2003. Stock Status reports are available at http://www.dfo-mpo.gc.ca/csas/.

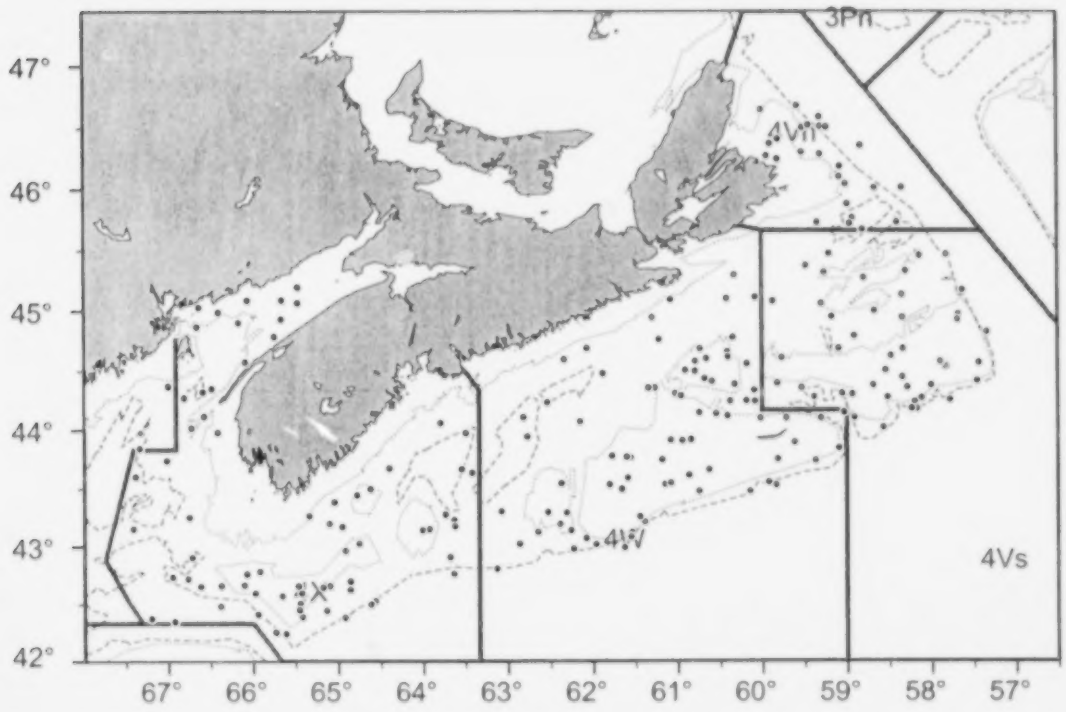


Fig. 1. SUMMER Groundfish Survey Positions 2000

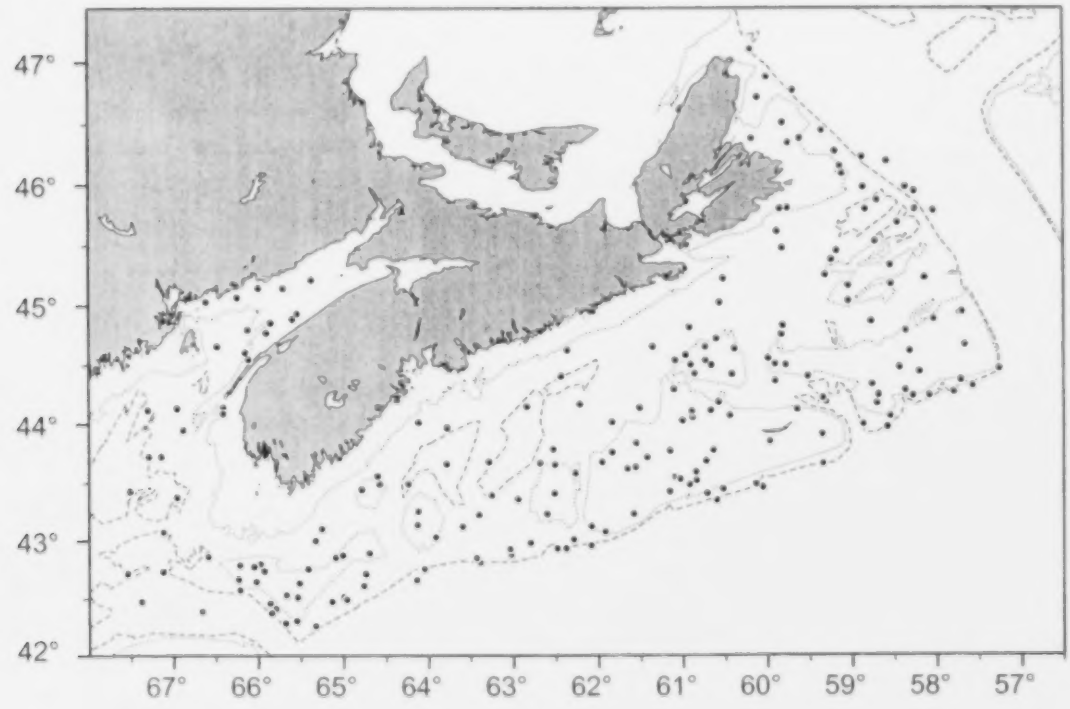


Fig. 2. SUMMER Groundfish Survey Positions 2001

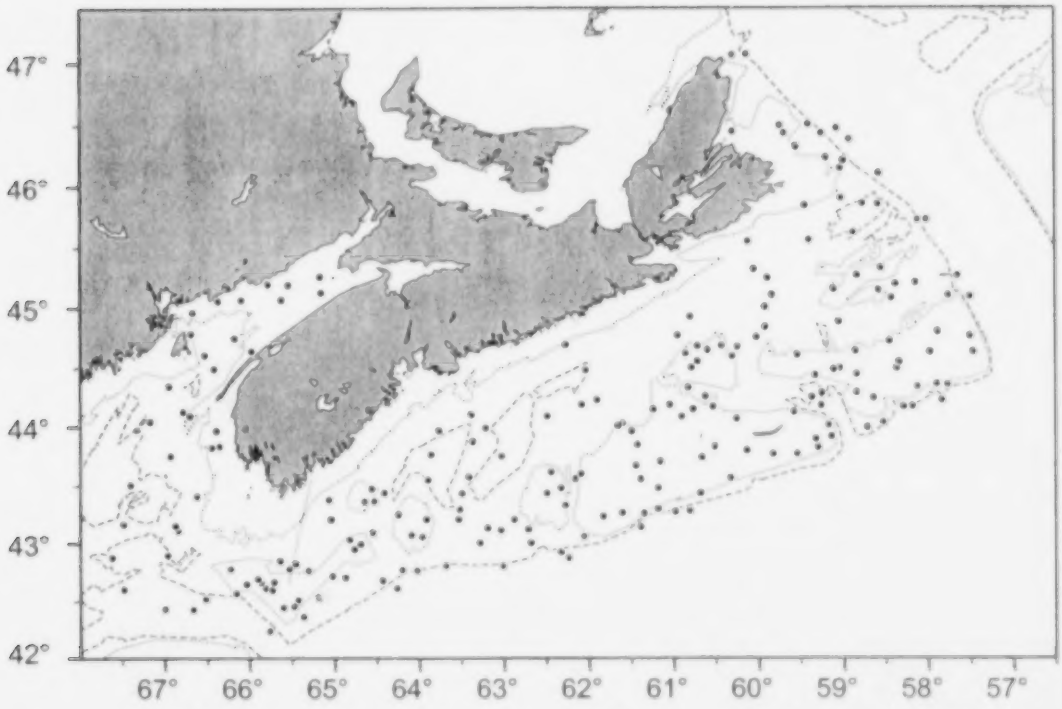


Fig. 3. SUMMER Groundfish Survey Positions 2002

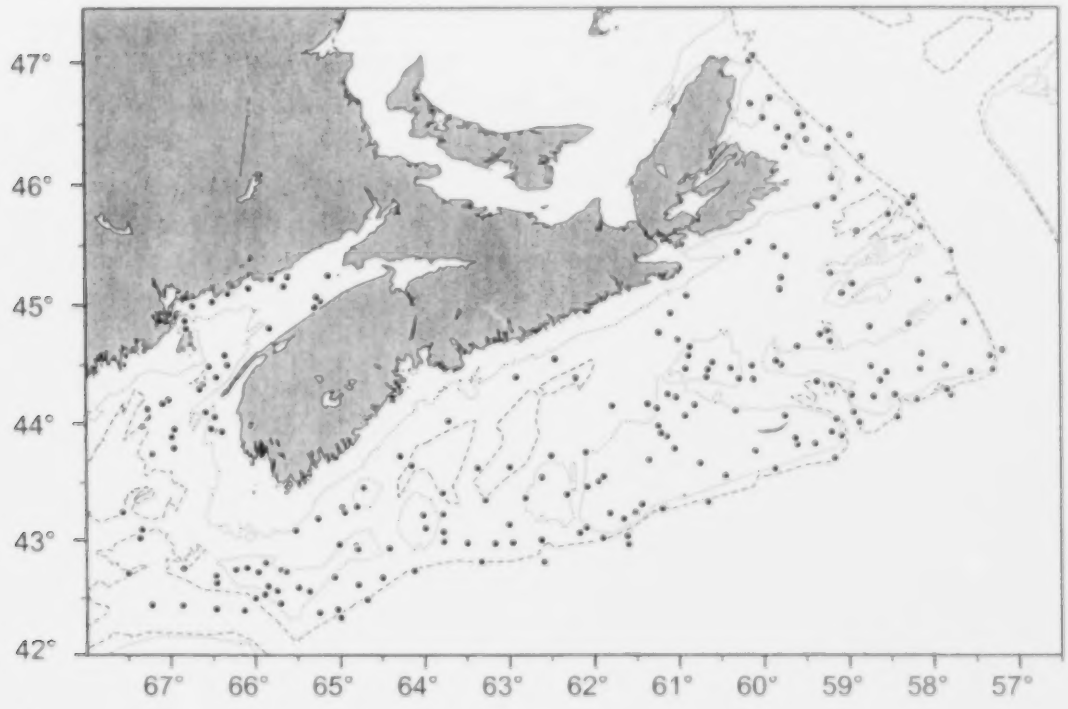


Fig. 4. SUMMER Groundfish Survey Positions 2003

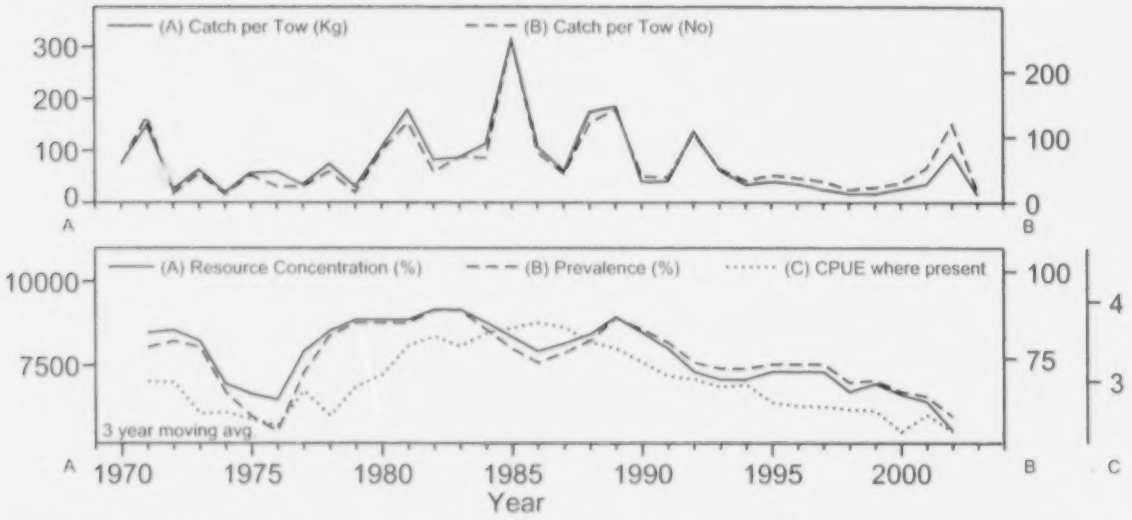


Fig. 5. 4Vn Cod stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

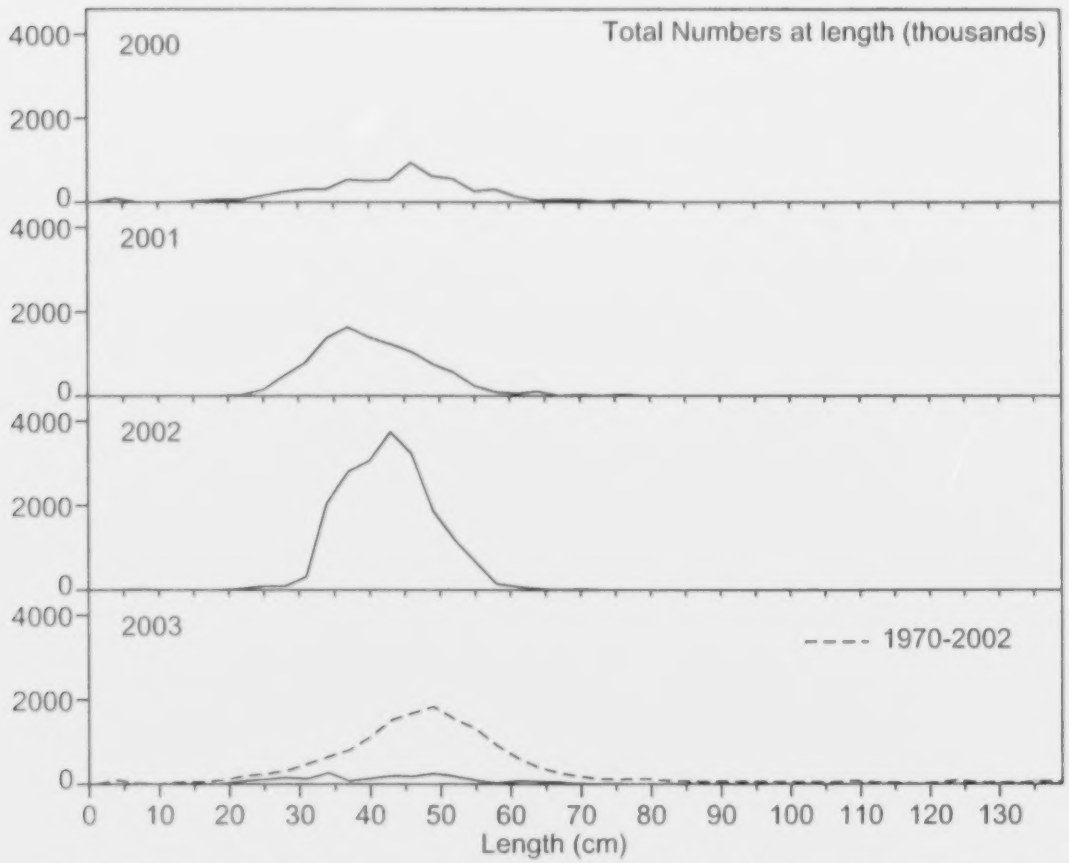


Fig. 6. 4Vn Cod length frequency distribution from the SUMMER Groundfish surveys.

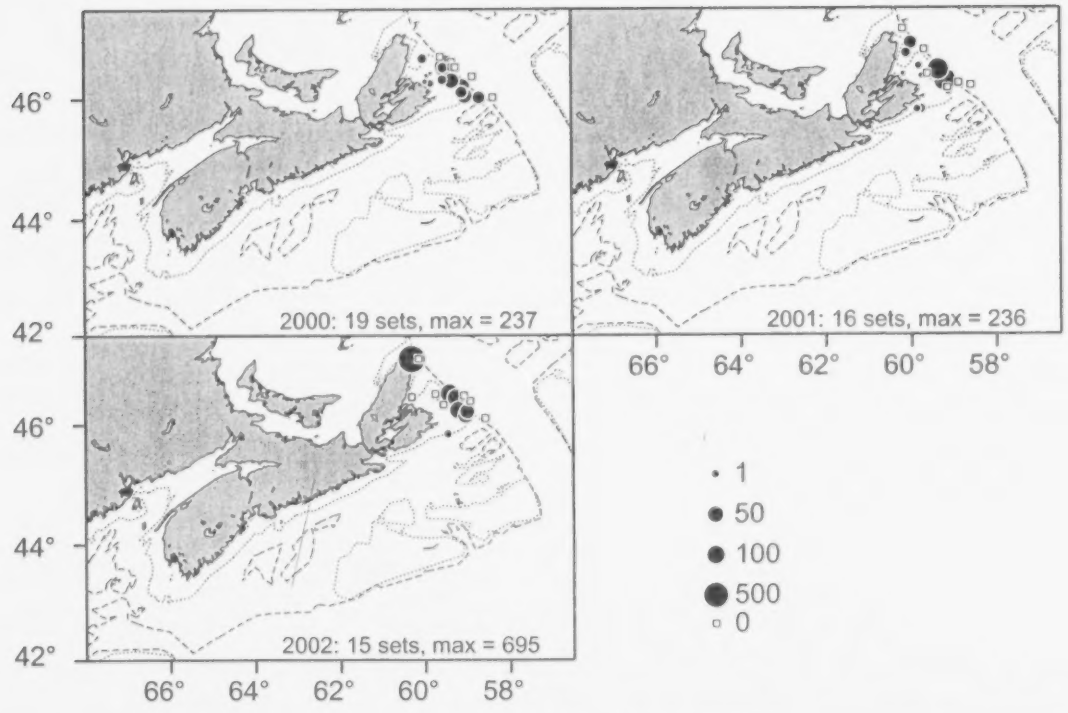


Fig. 7. 4Vn Cod Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

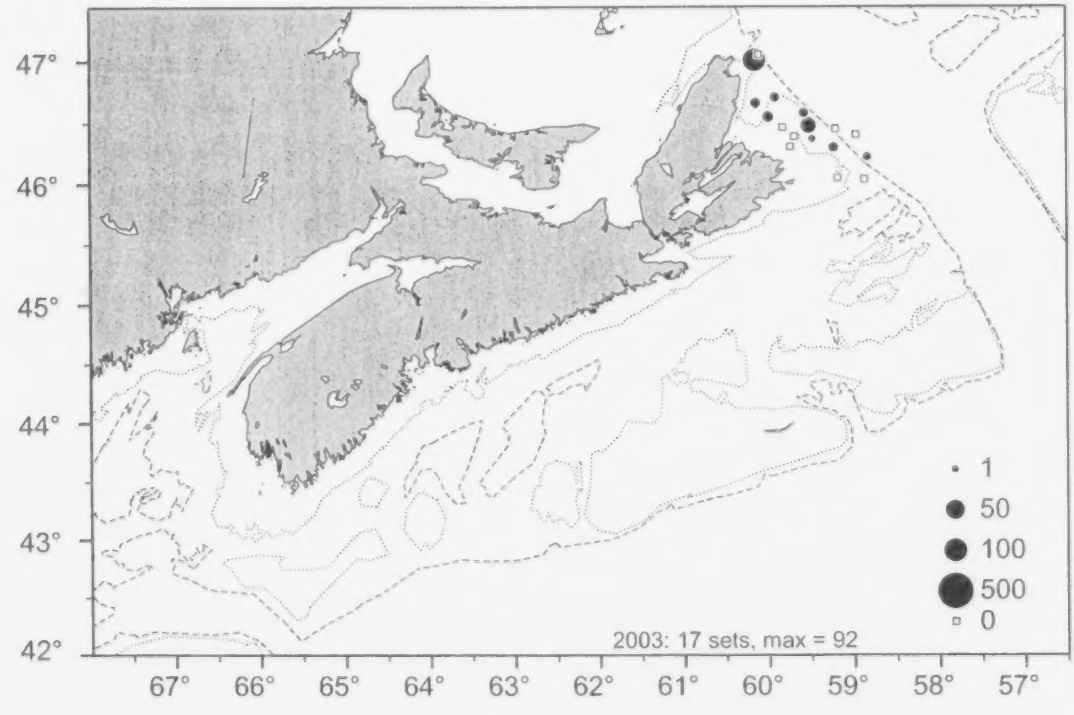


Fig. 8. 4Vn Cod Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

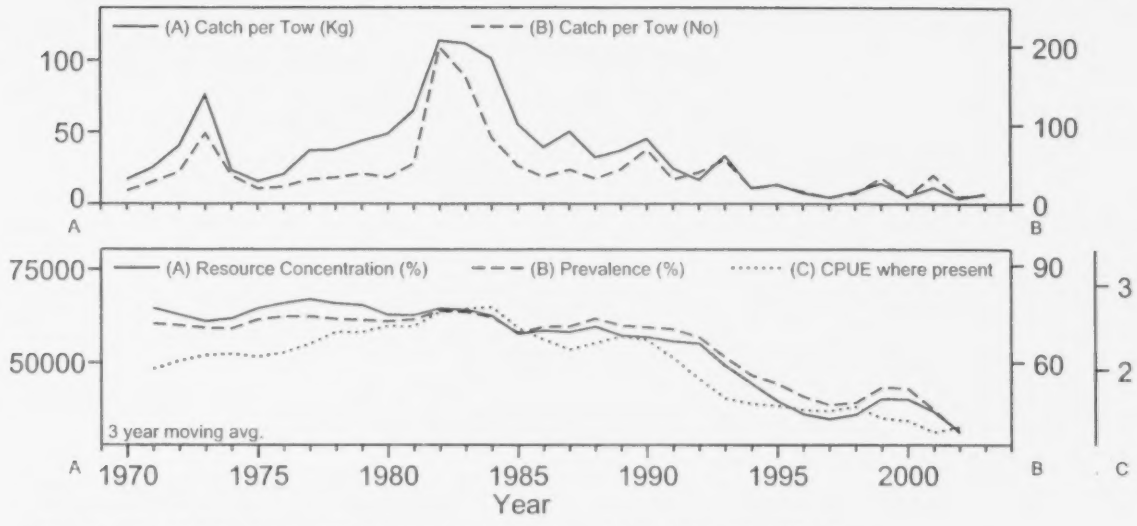


Fig. 9. 4VsW Cod stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

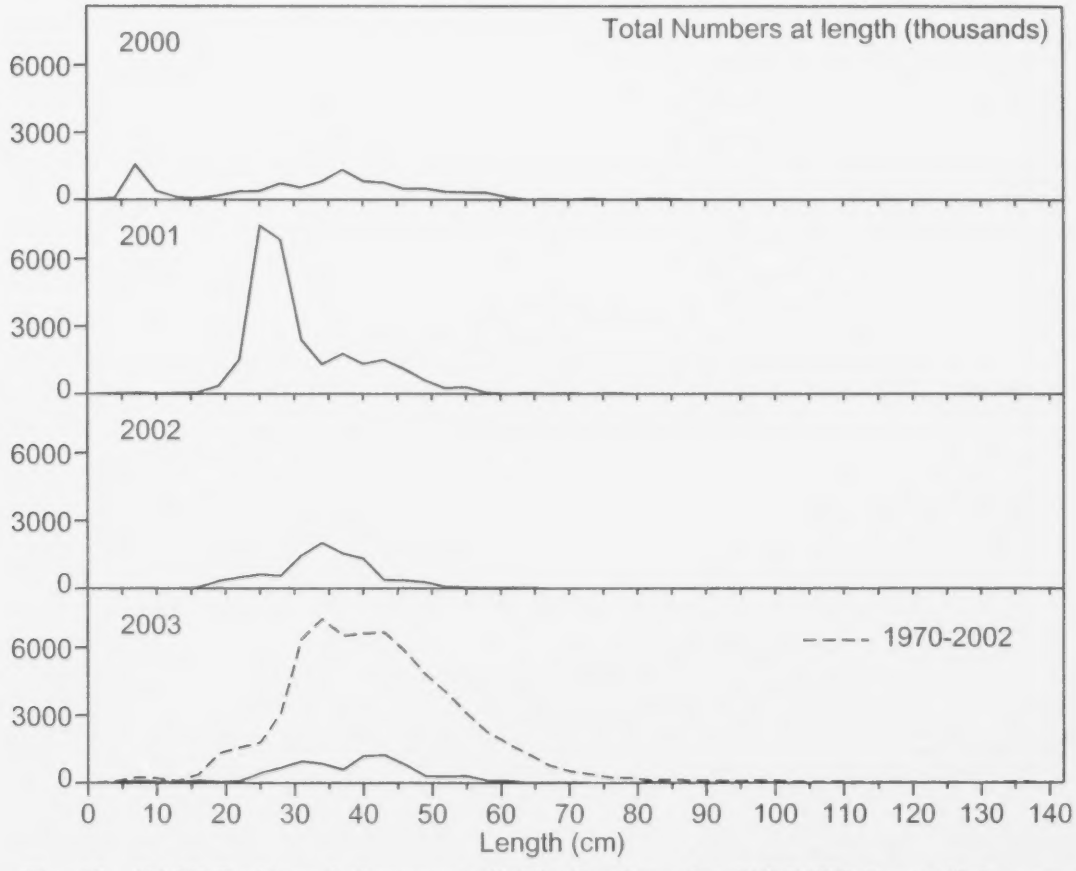


Fig. 10. 4VsW Cod length frequency distribution from the SUMMER Groundfish surveys.

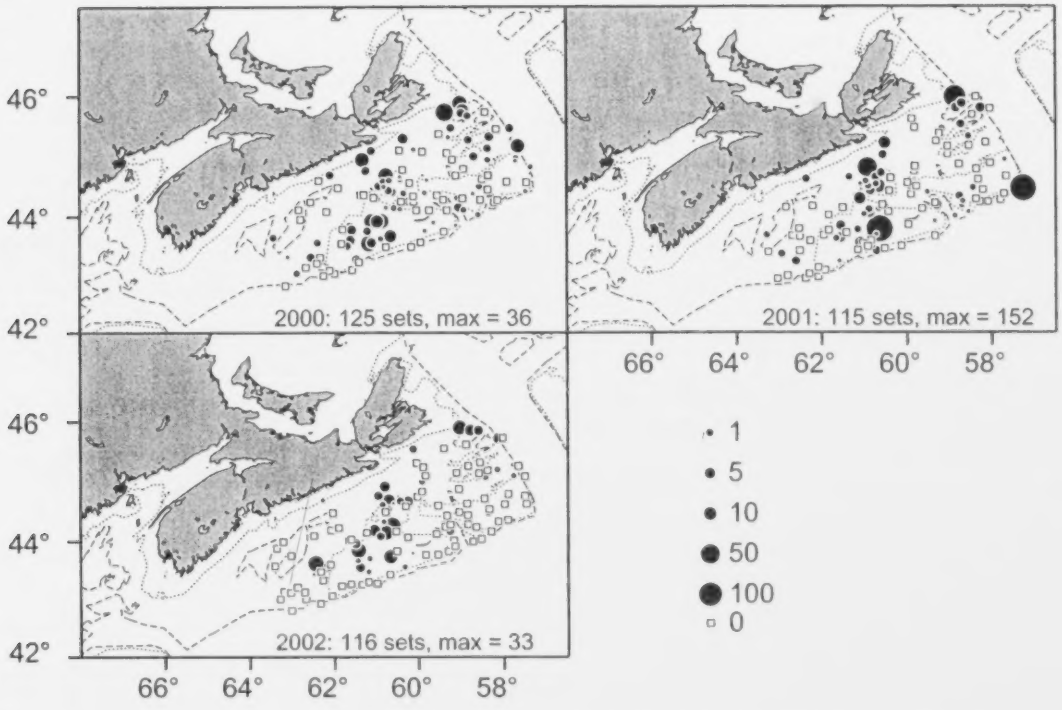


Fig. 11. 4VsW Cod Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

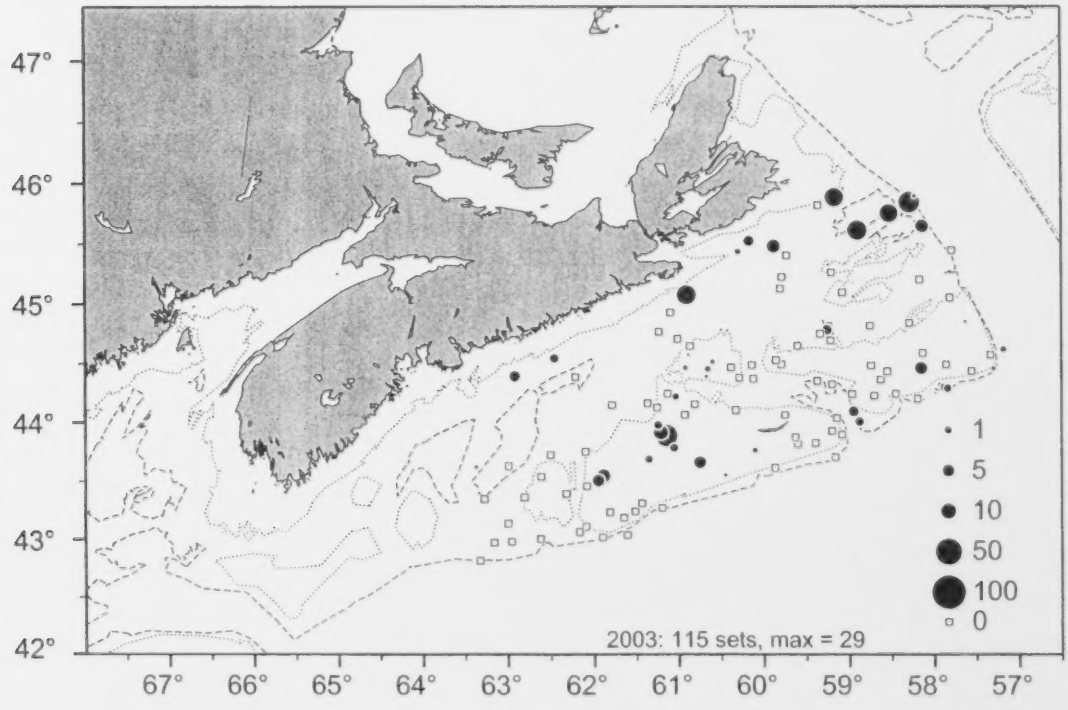


Fig. 12. 4VsW Cod Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

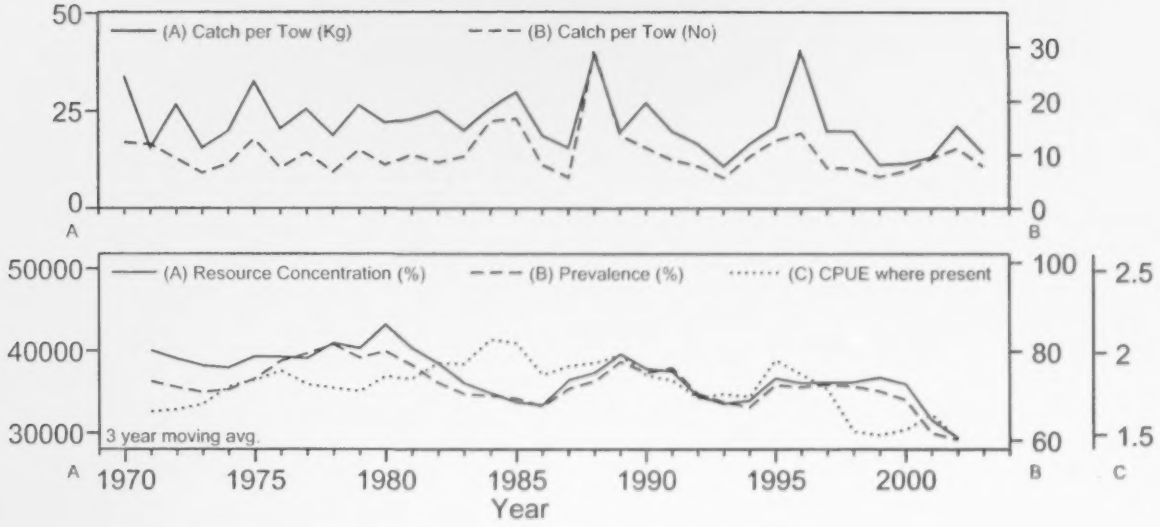


Fig. 13. 4X Cod stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

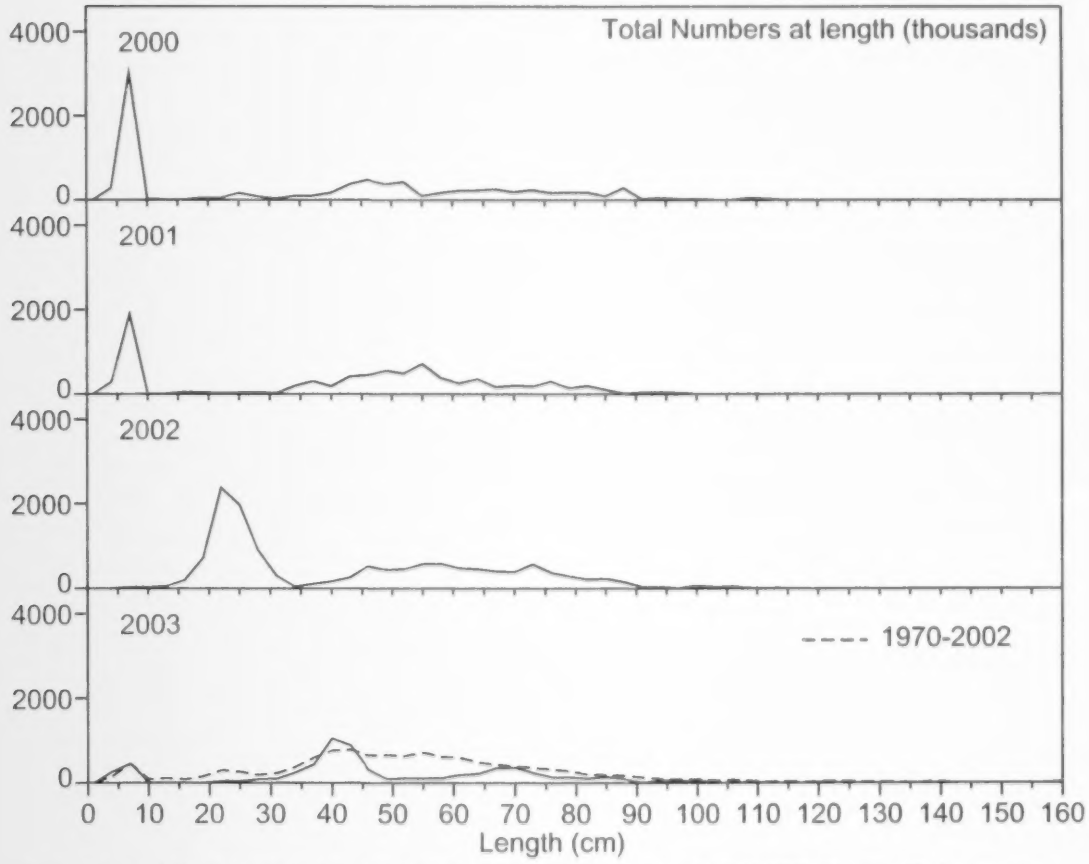


Fig. 14. 4X Cod length frequency distribution from the SUMMER Groundfish surveys.

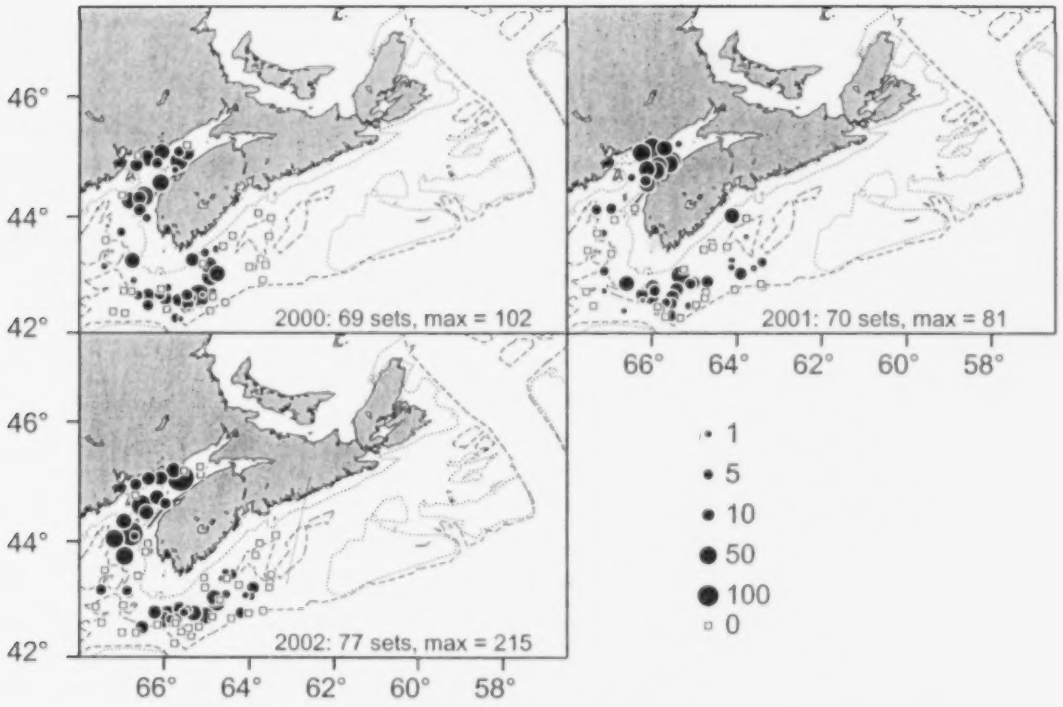


Fig. 15. 4X Cod Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

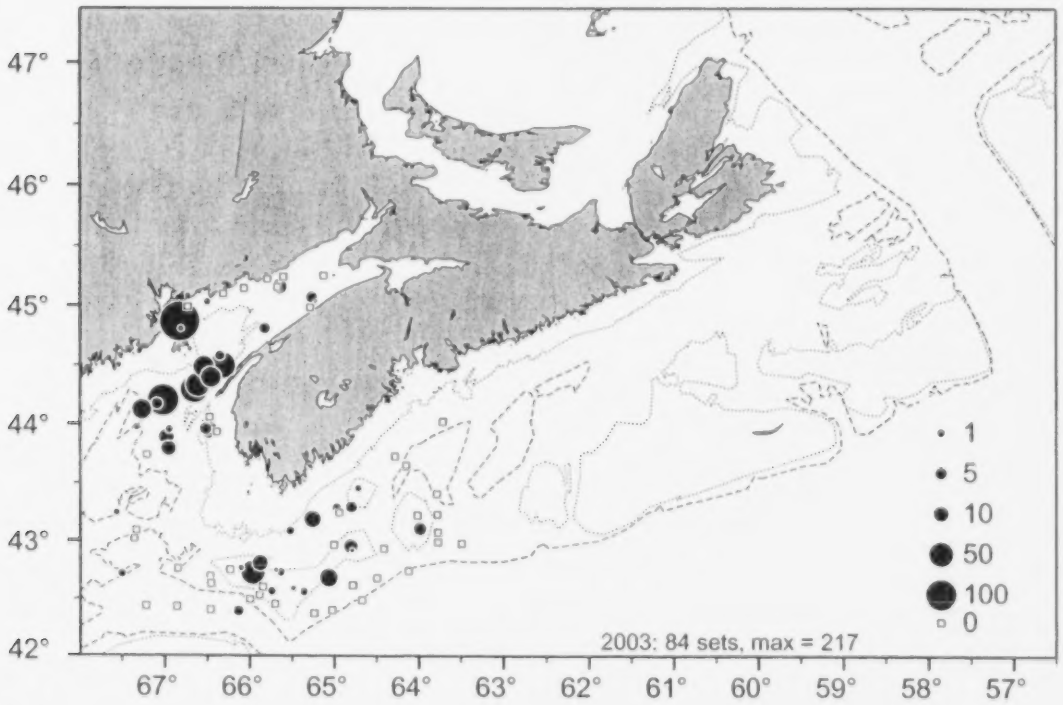


Fig. 16. 4X Cod Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

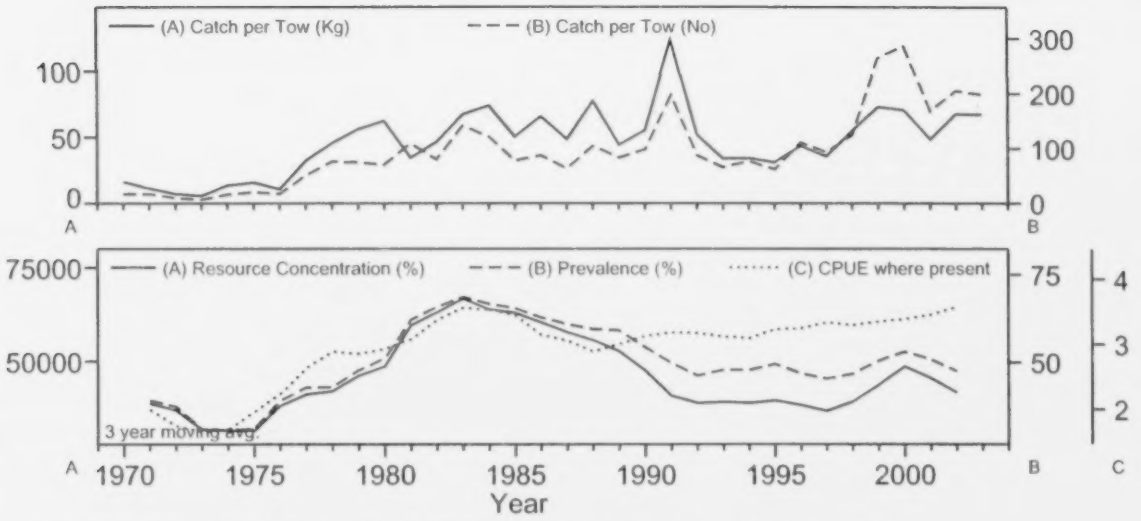


Fig. 17. 4VW Haddock stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

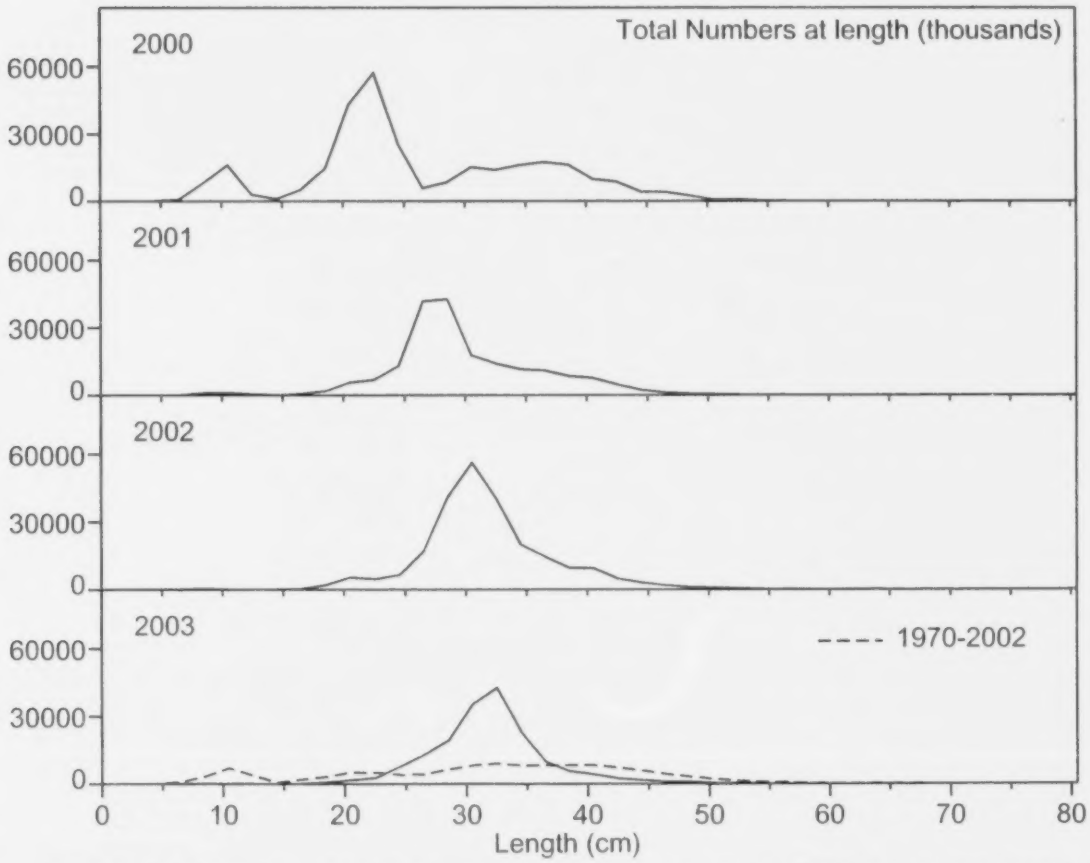


Fig. 18. 4VW Haddock length frequency distribution from the SUMMER Groundfish surveys.

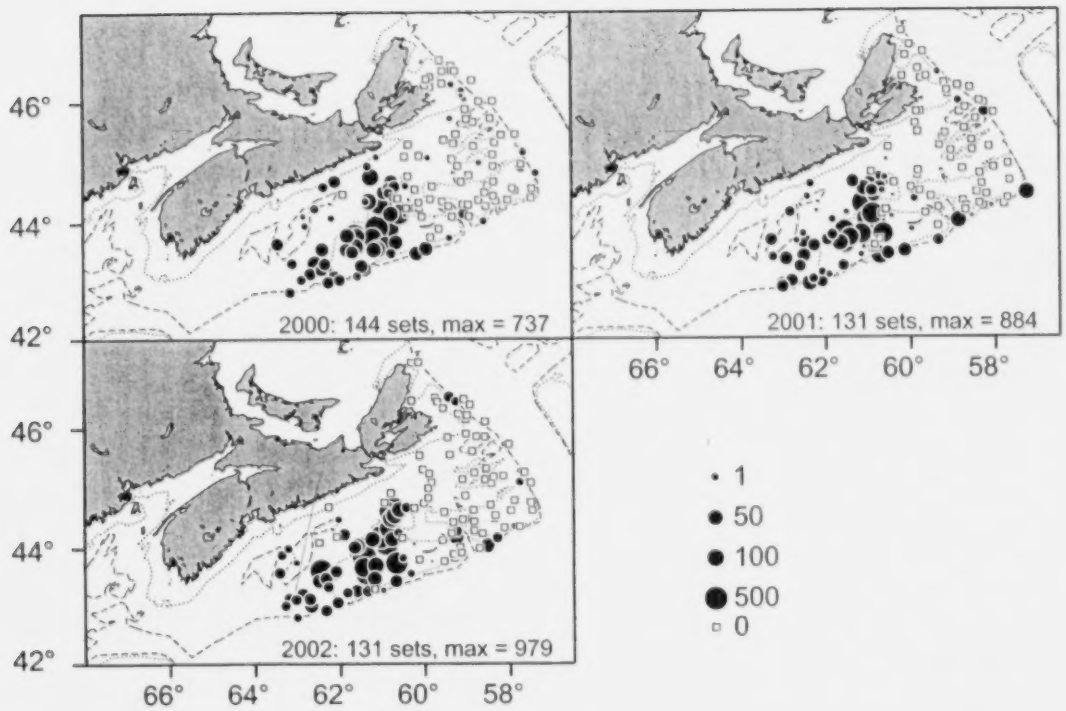


Fig. 19. 4VW Haddock Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

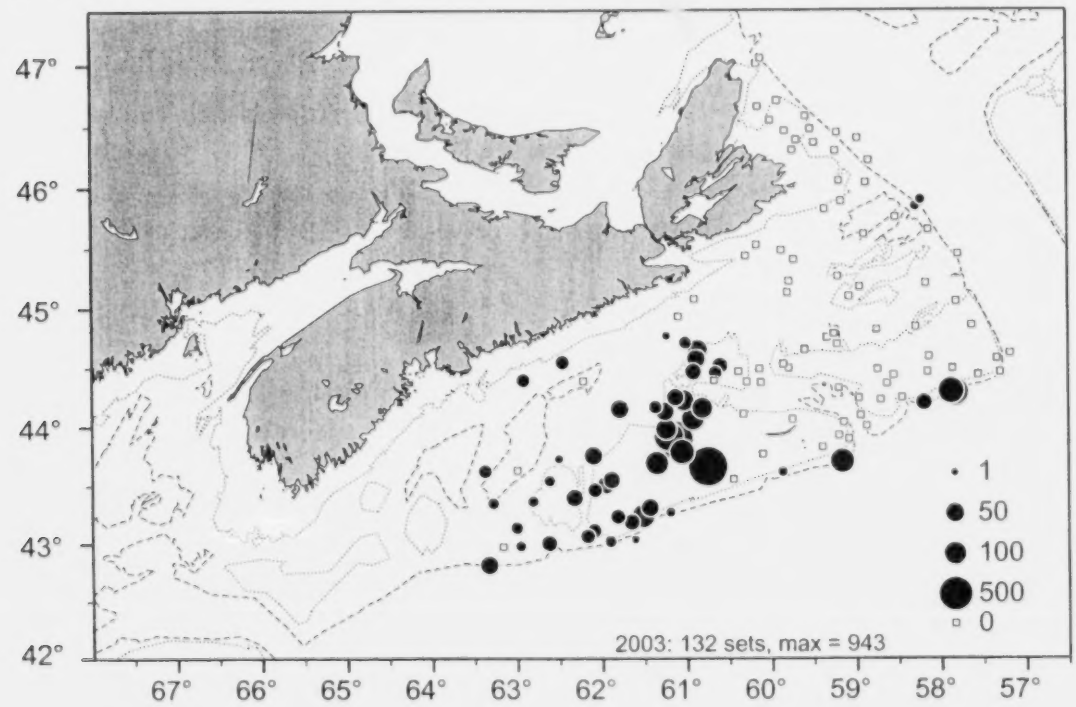


Fig. 20. 4VW Haddock Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

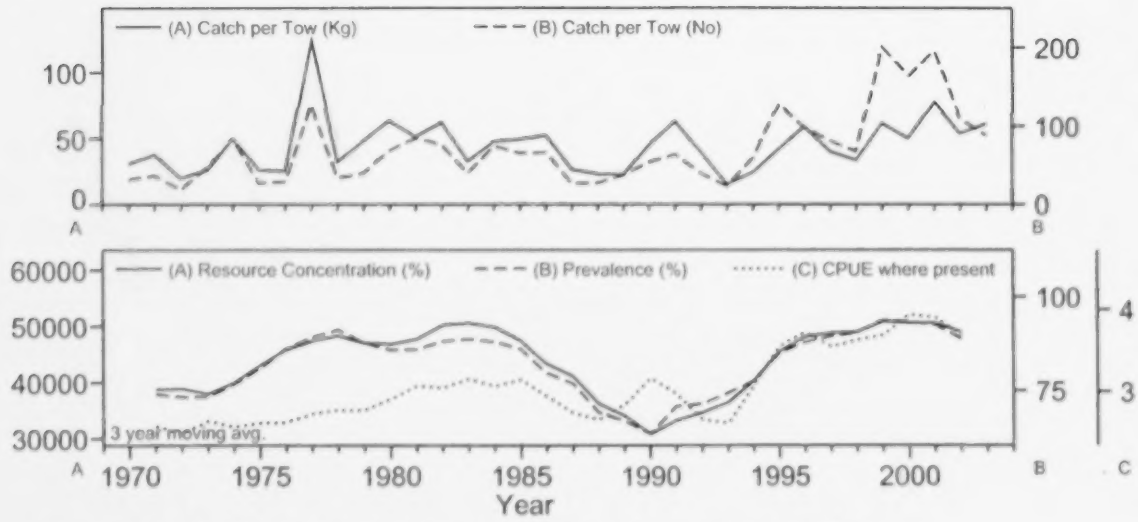


Fig. 21. 4X Haddock stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

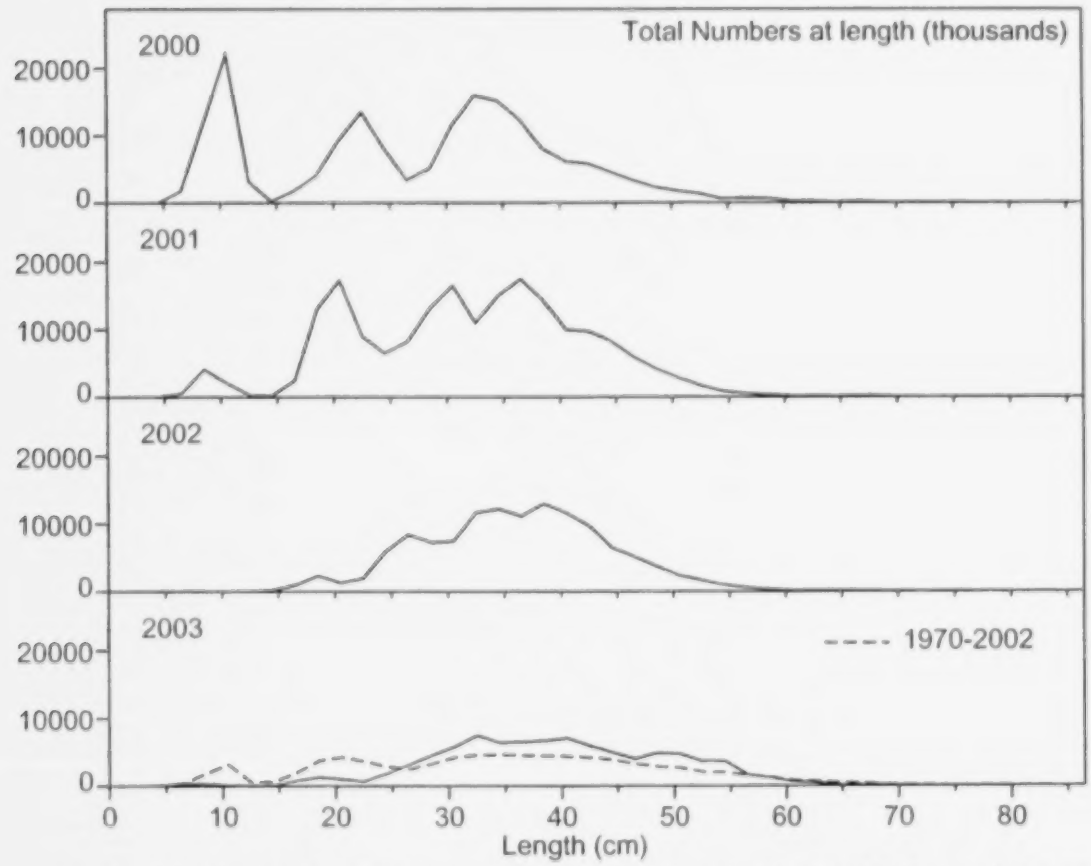


Fig. 22. 4X Haddock length frequency distribution from the SUMMER Groundfish surveys.

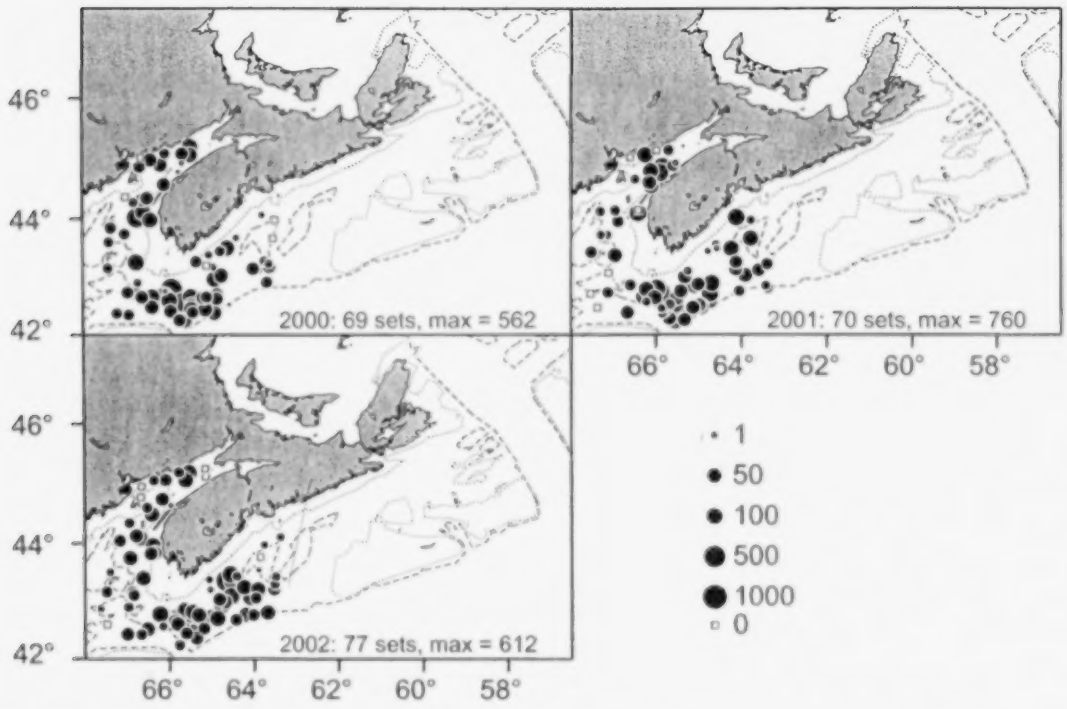


Fig. 23. 4X Haddock Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

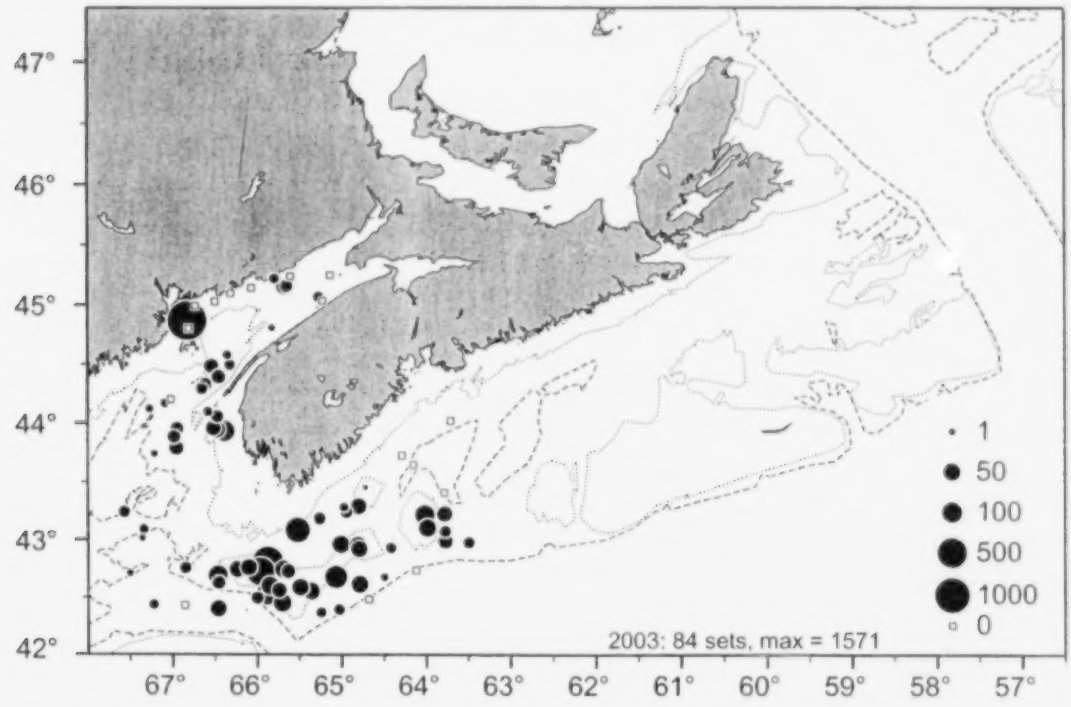


Fig. 24. 4X Haddock Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

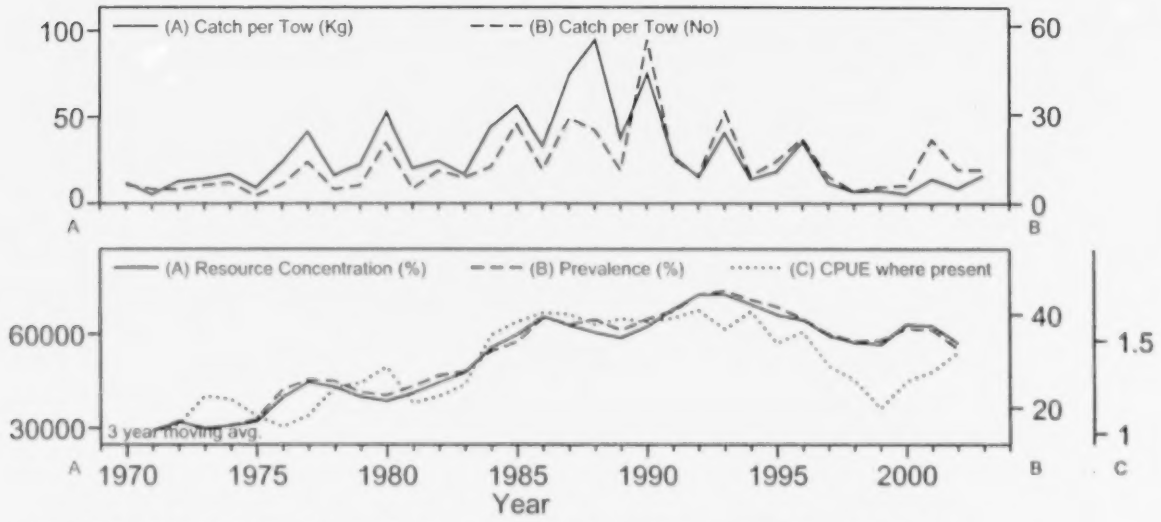


Fig. 25. 4VWX Pollock stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

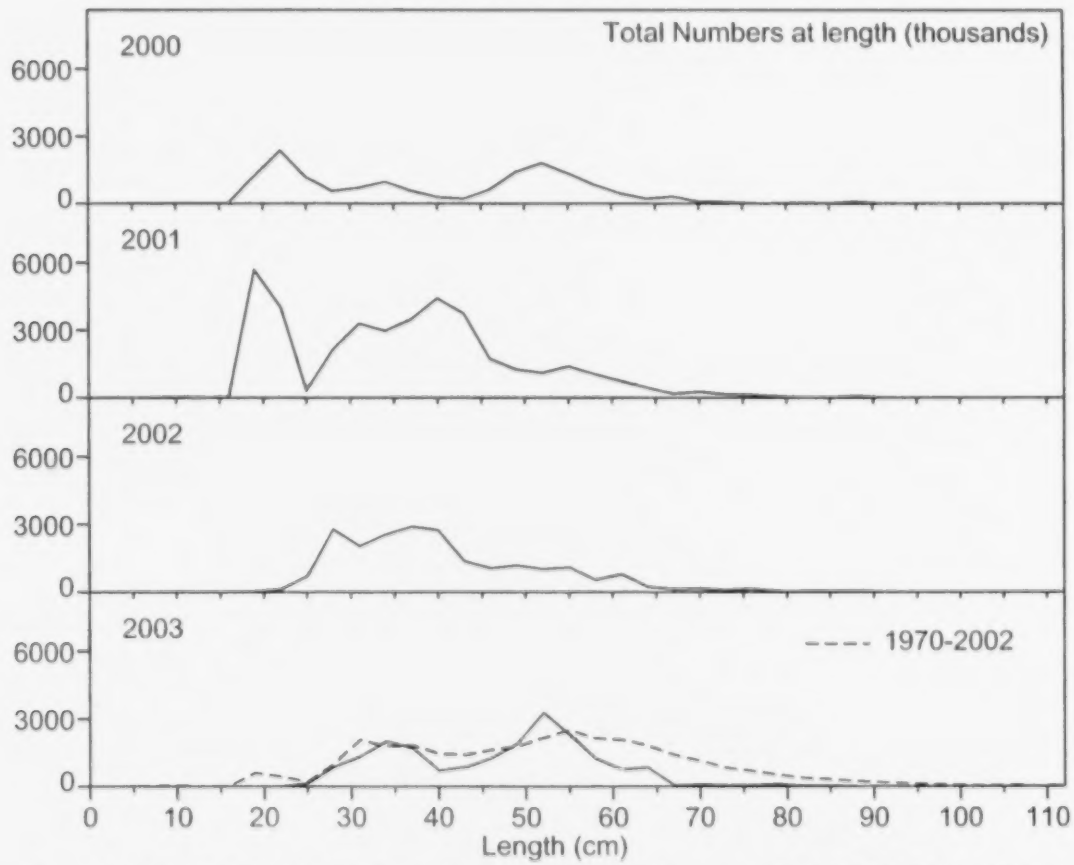


Fig. 26. 4VWX Pollock length frequency distribution from the SUMMER Groundfish surveys.

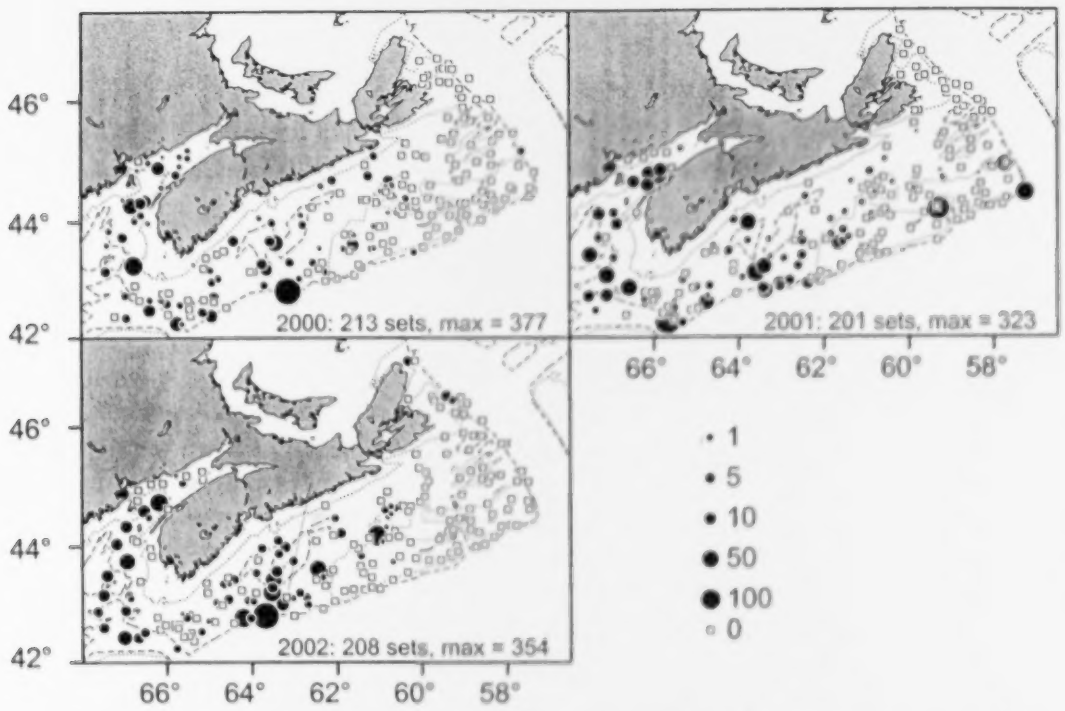


Fig. 27. 4VWX Pollock Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

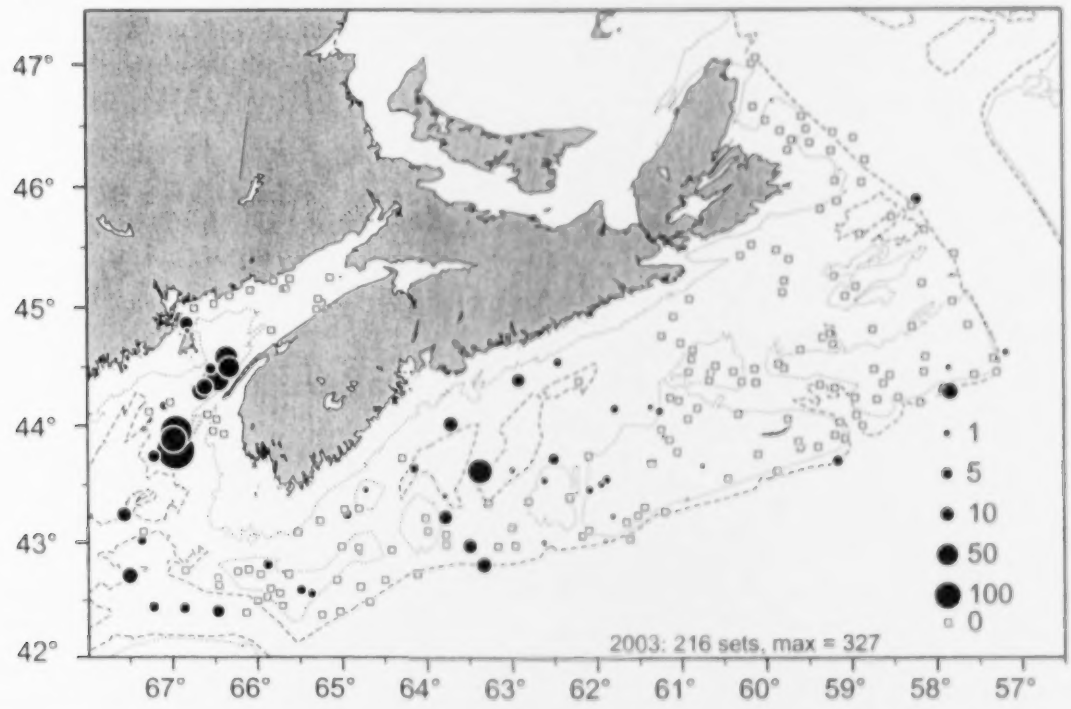


Fig. 28. 4VWX Pollock Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

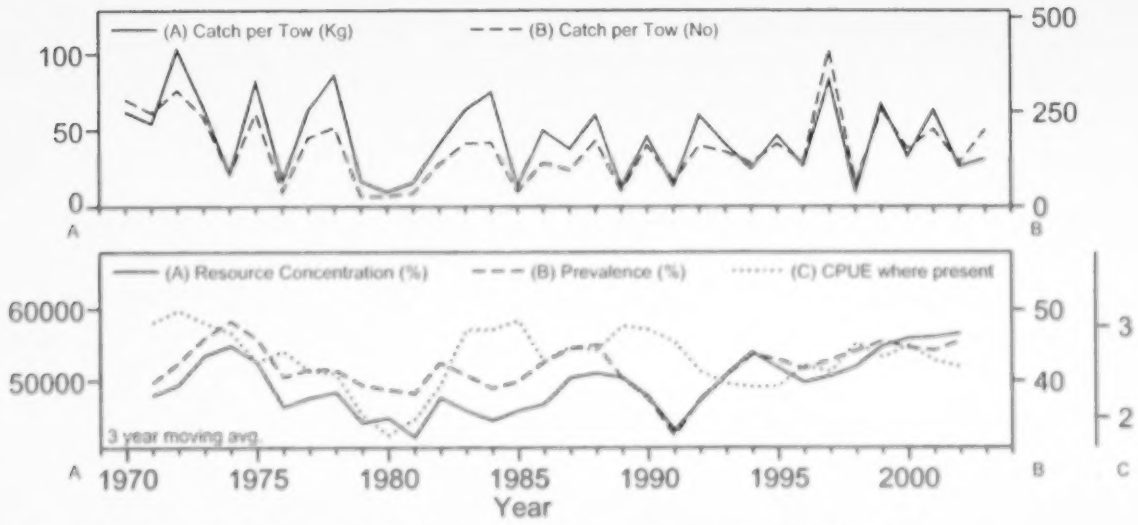


Fig. 29. Unit3 Redfish stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

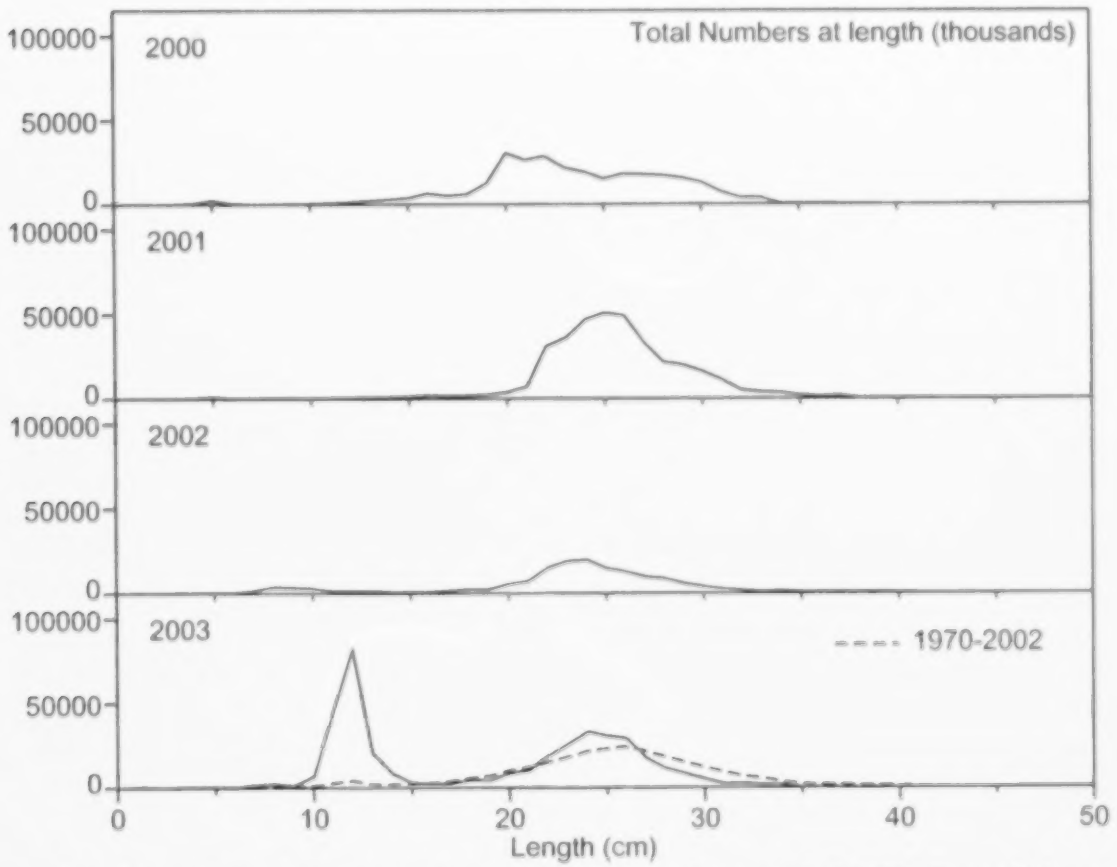


Fig. 30. Unit3 Redfish length frequency distribution from the SUMMER Groundfish surveys.

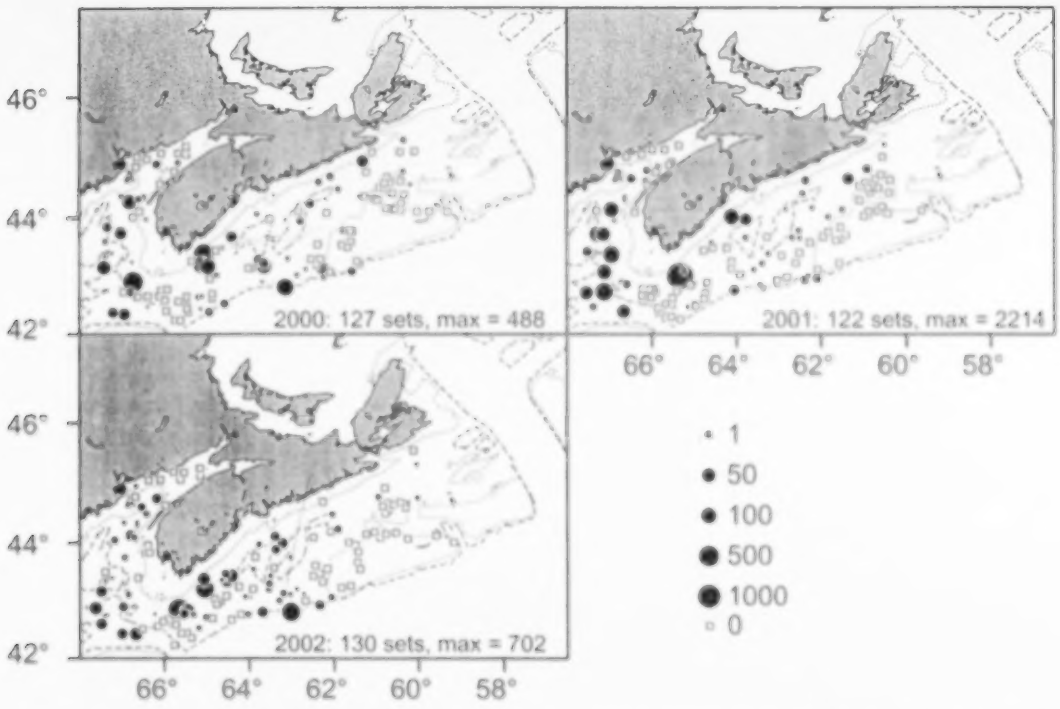


Fig. 31. Unit3 Redfish Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

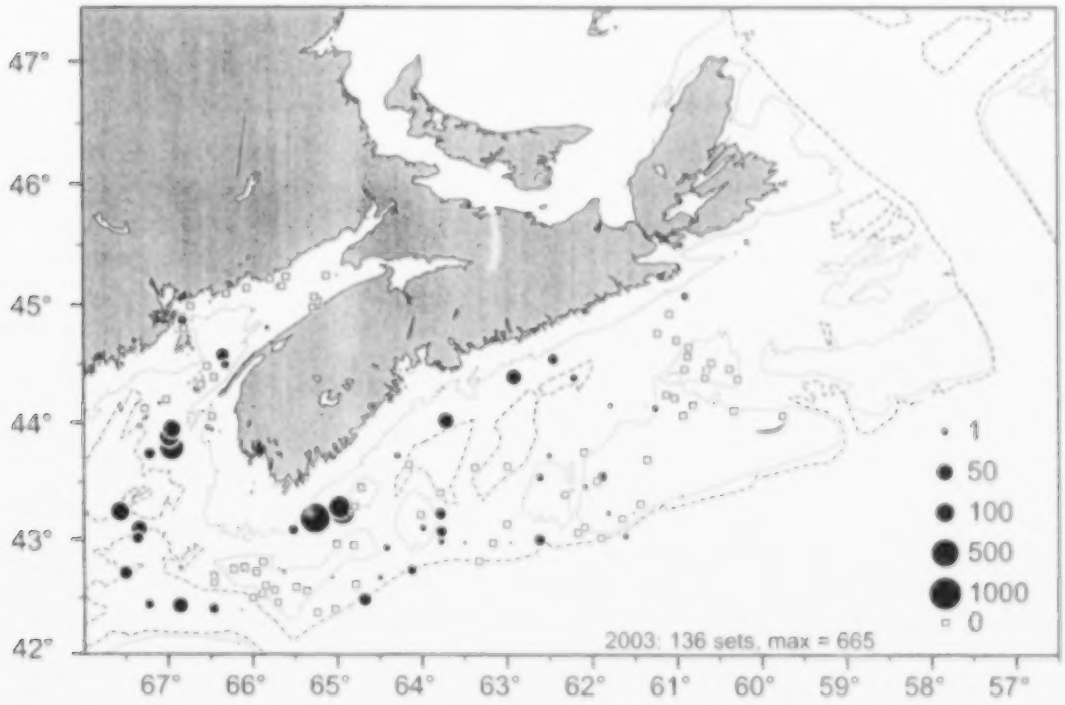


Fig. 32. Unit3 Redfish Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

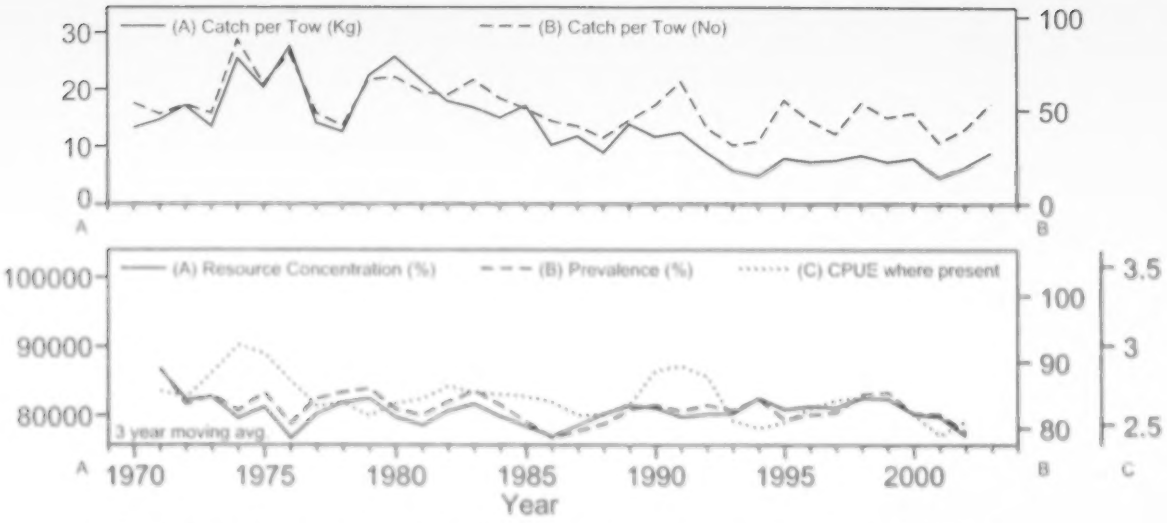


Fig. 33. 4VW American Plaice stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

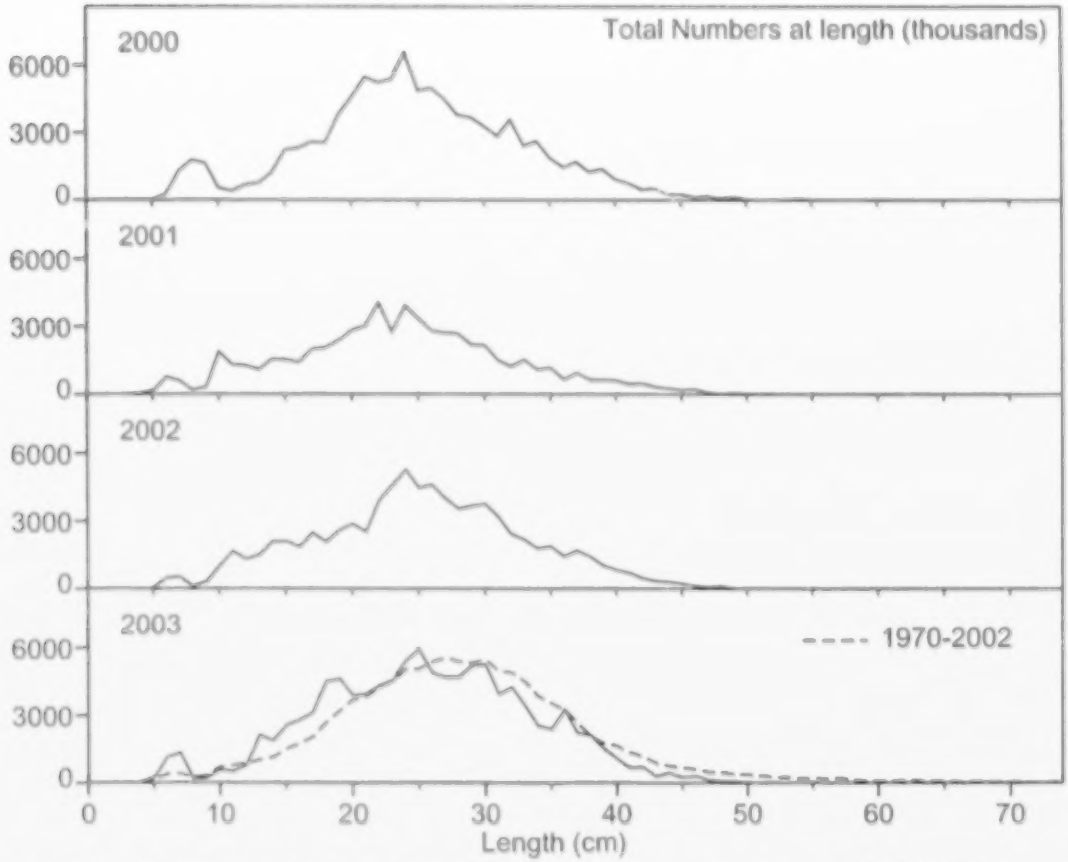


Fig. 34. 4VW American Plaice length frequency distribution from the SUMMER Groundfish surveys.

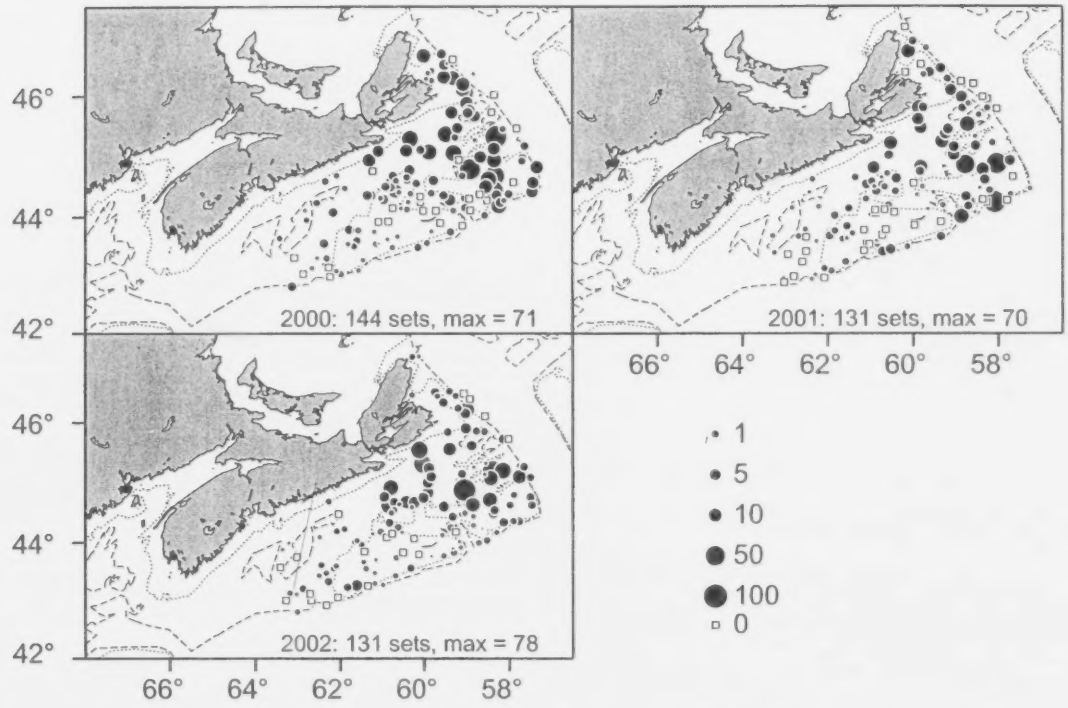


Fig. 35. 4VW American Plaice Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

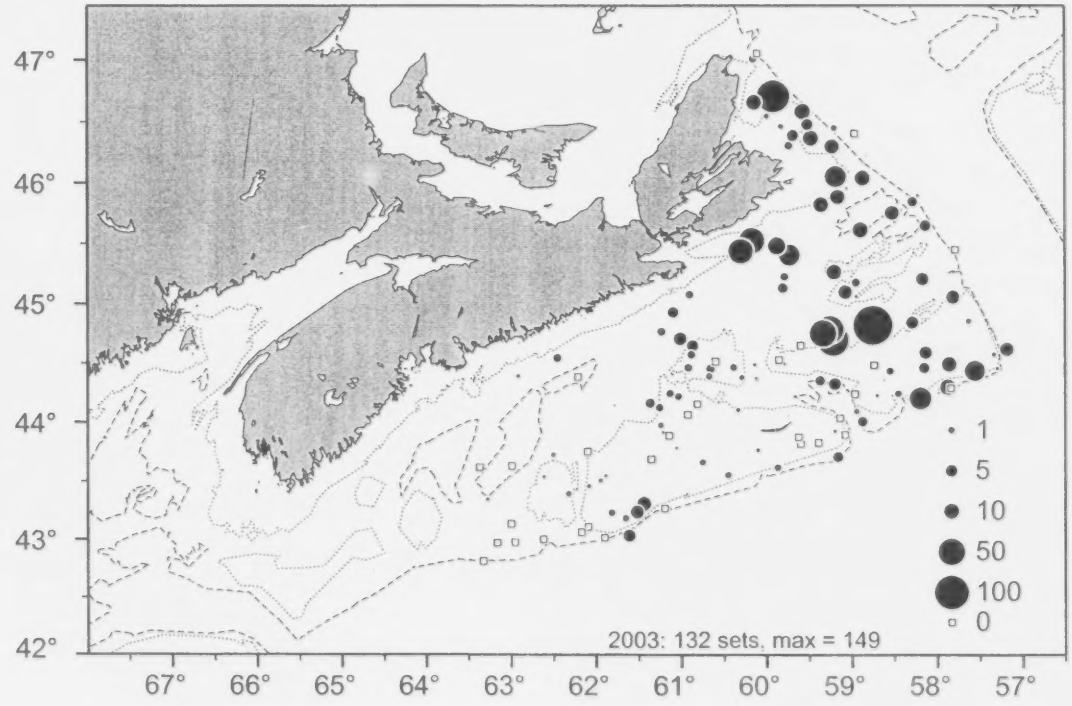


Fig. 36. 4VW American Plaice Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

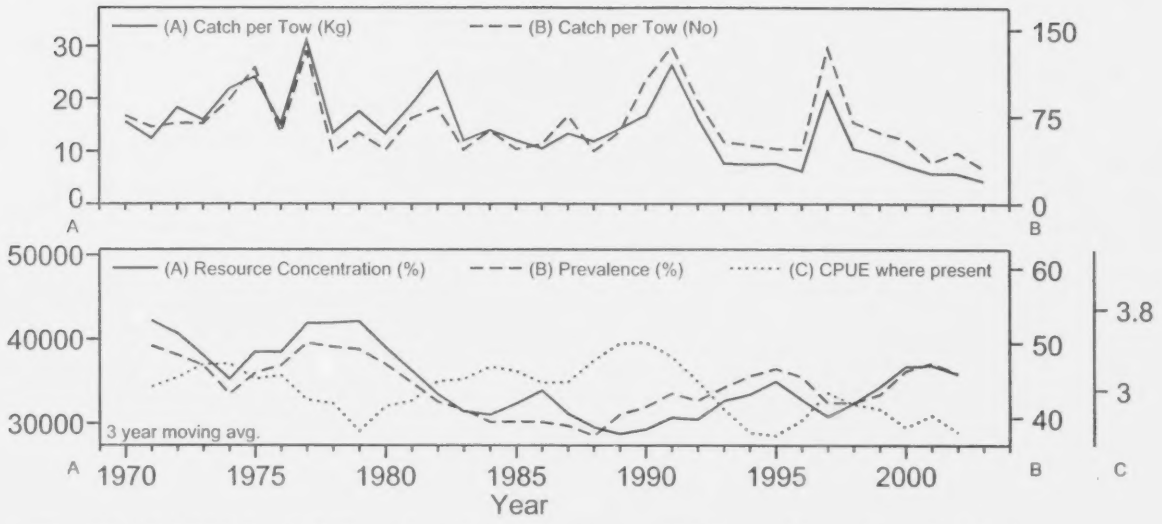


Fig. 37. 4VW Yellowtail Flounder stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

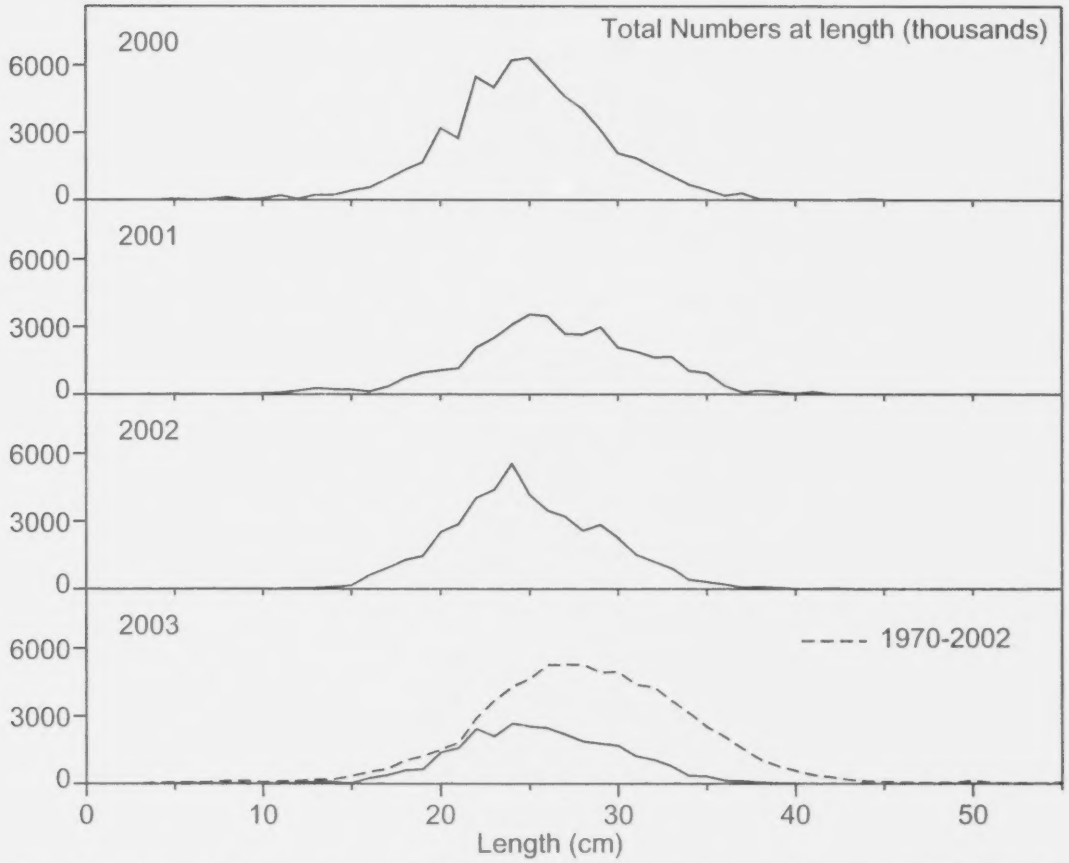


Fig. 38. 4VW Yellowtail Flounder length frequency distribution from the SUMMER Groundfish surveys.

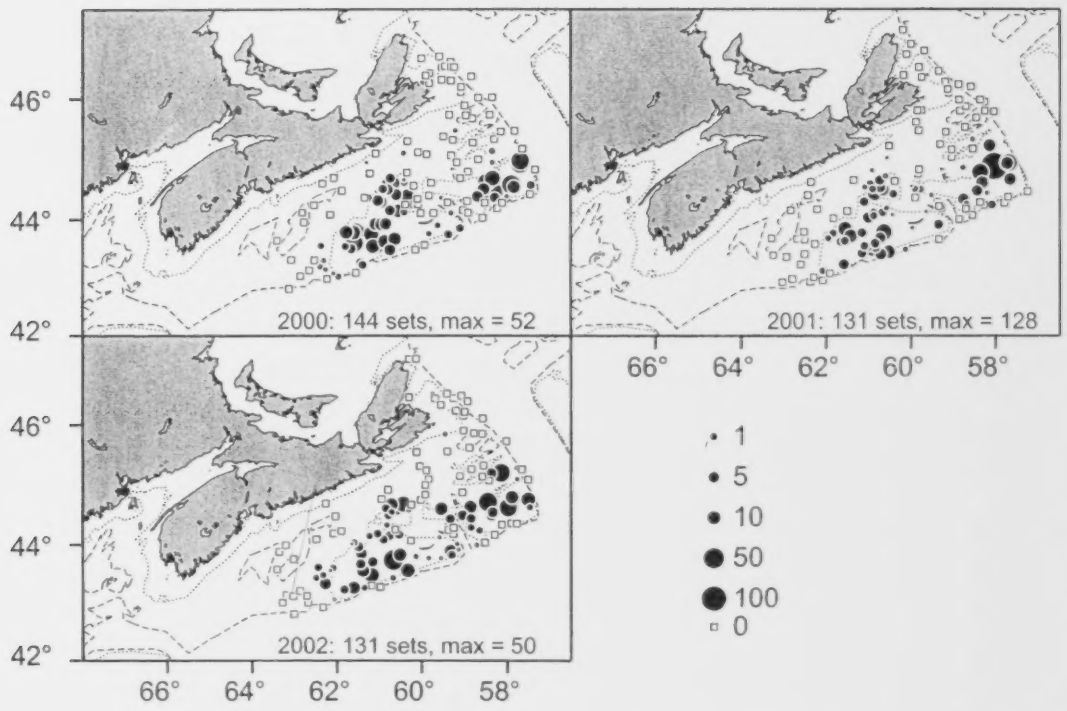


Fig. 39. 4VW Yellowtail Flounder Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

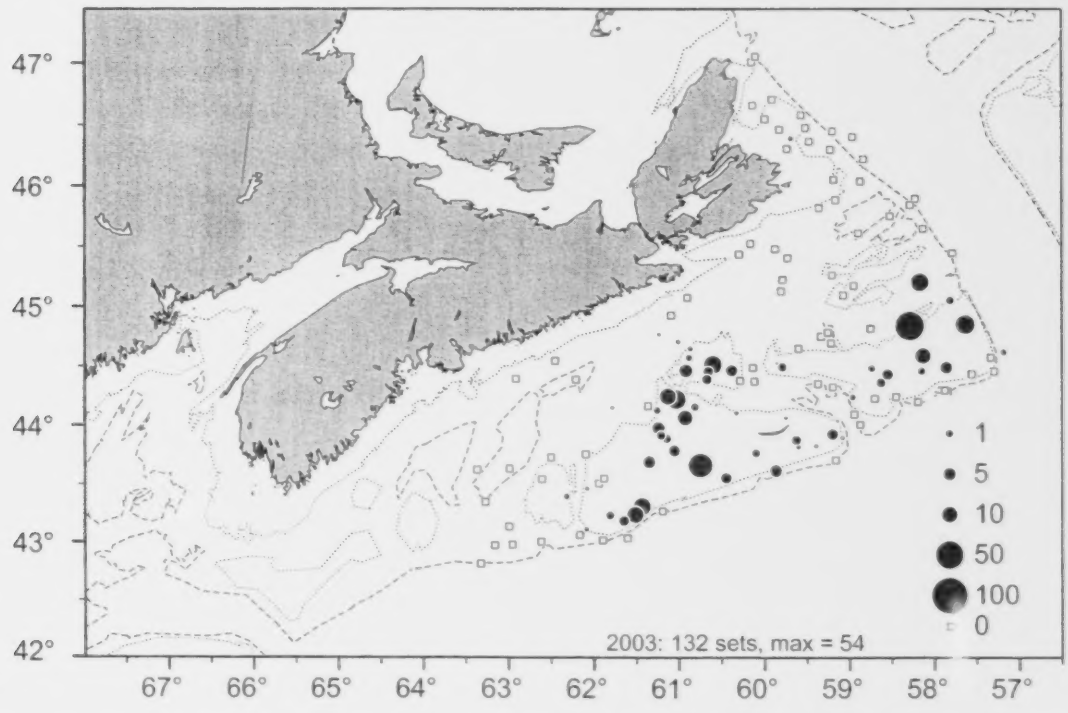


Fig. 40. 4VW Yellowtail Flounder Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

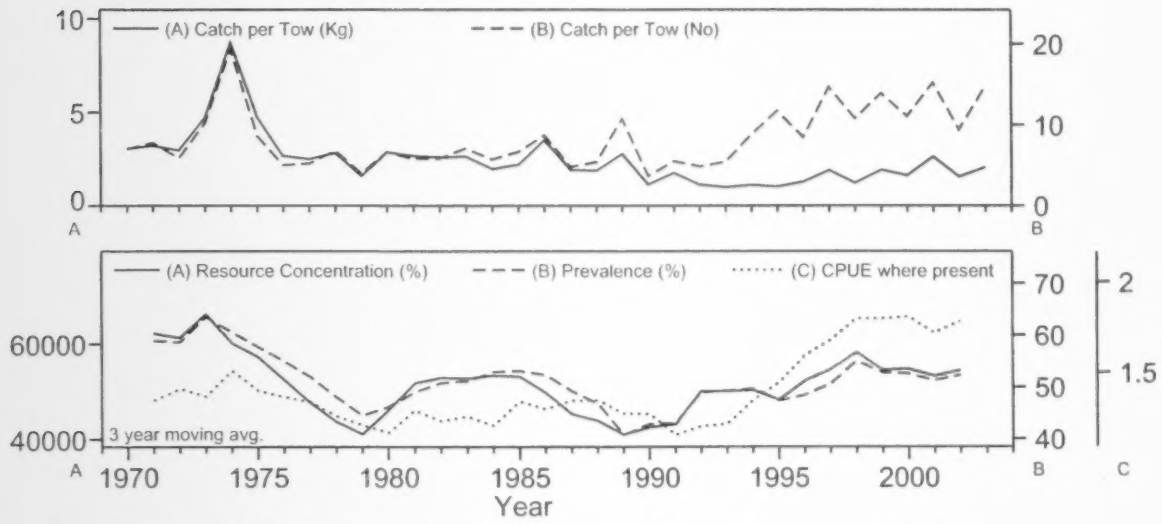


Fig. 41. 4VW Witch Flounder stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

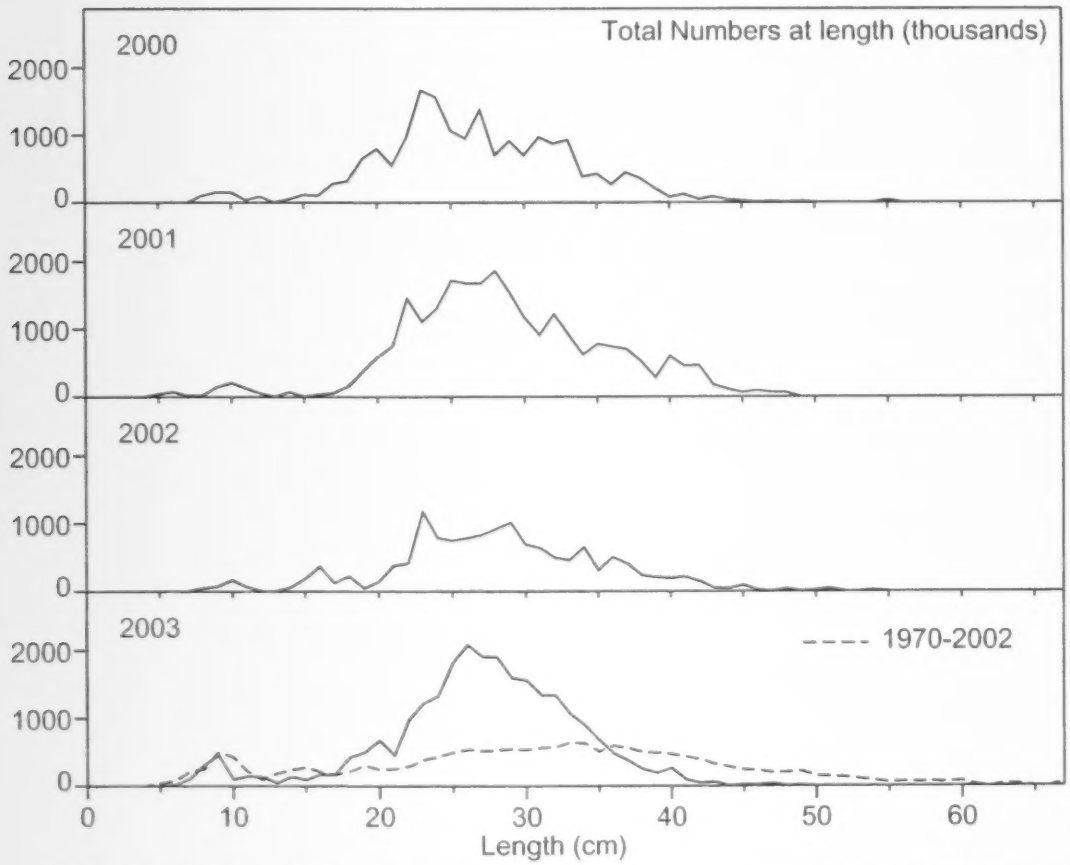


Fig. 42. 4VW Witch Flounder length frequency distribution from the SUMMER Groundfish surveys.

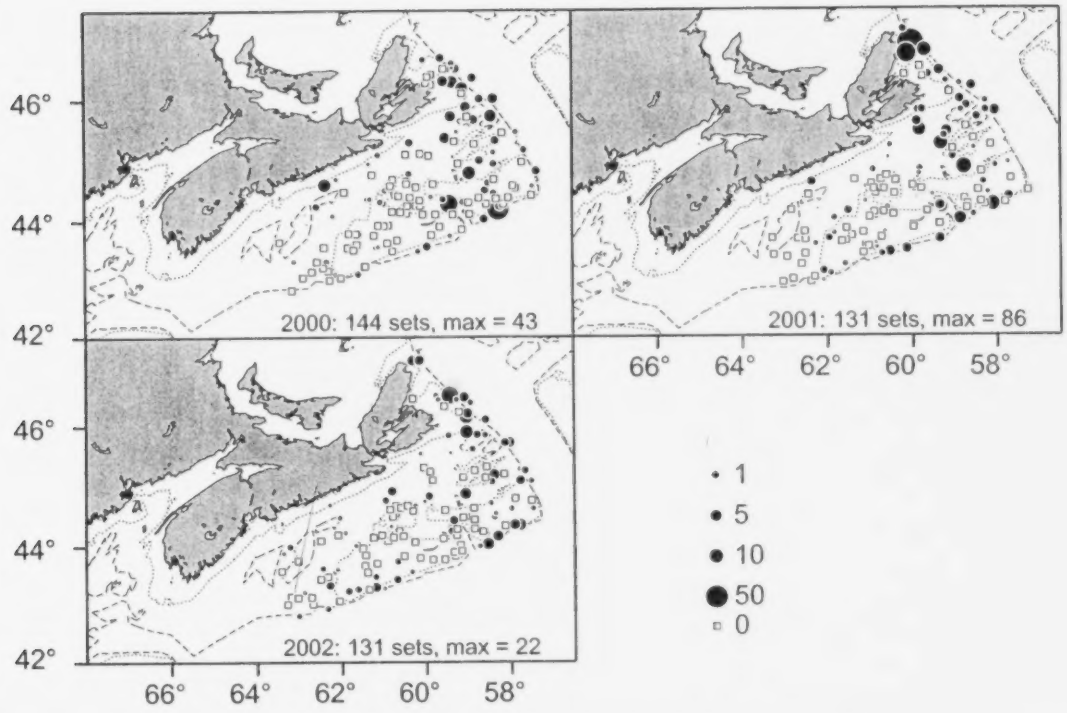


Fig. 43. 4VW Witch Flounder Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

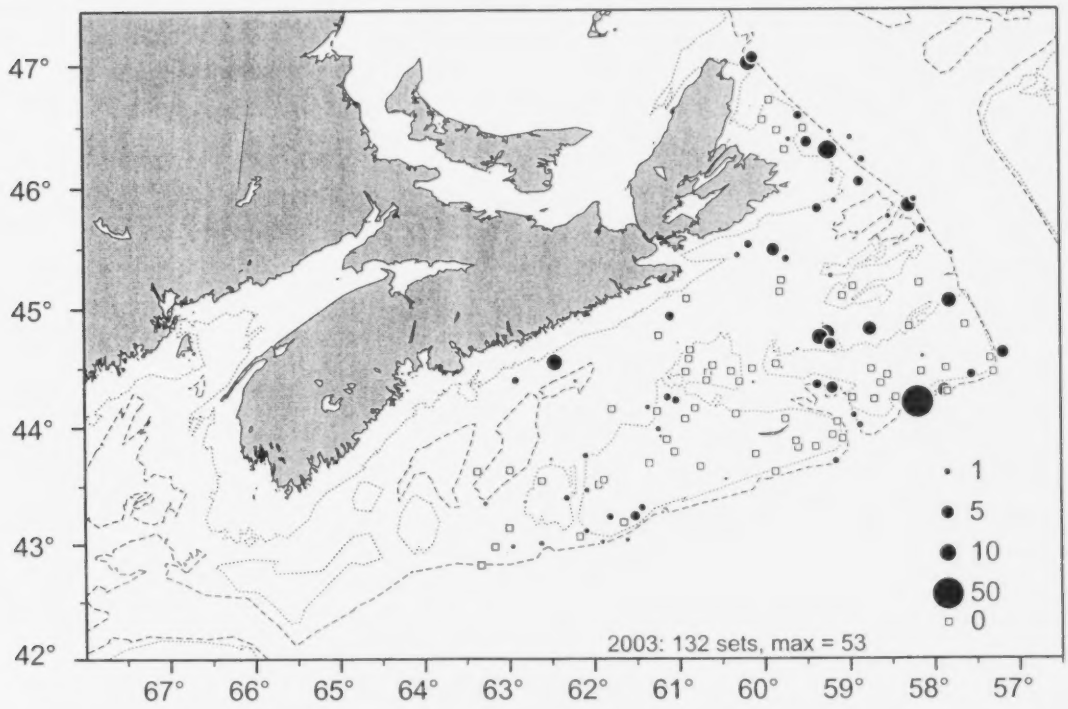


Fig. 44. 4VW Witch Flounder Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

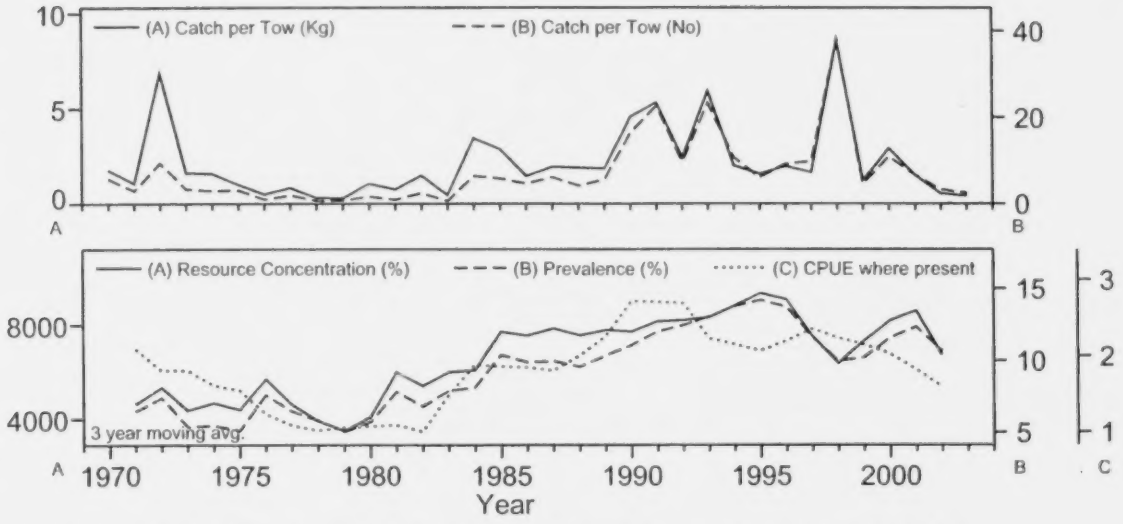


Fig. 45. 4VW Winter Flounder stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

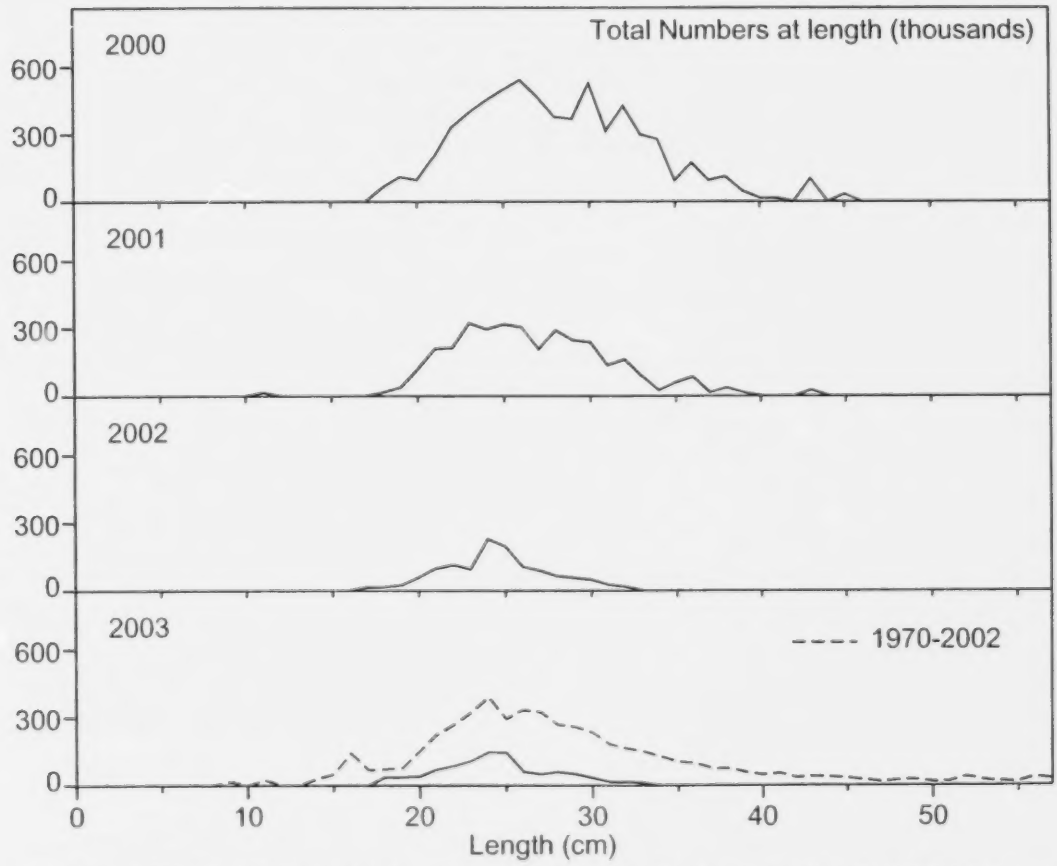


Fig. 46. 4VW Winter Flounder length frequency distribution from the SUMMER Groundfish surveys.

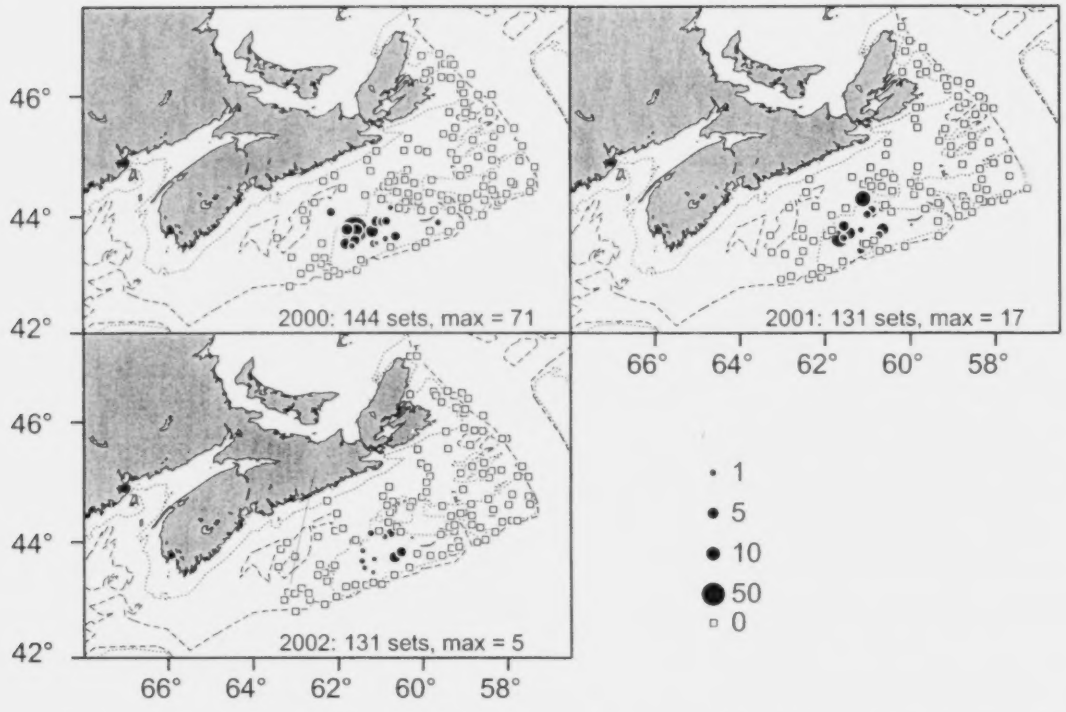


Fig. 47. 4VW Winter Flounder Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

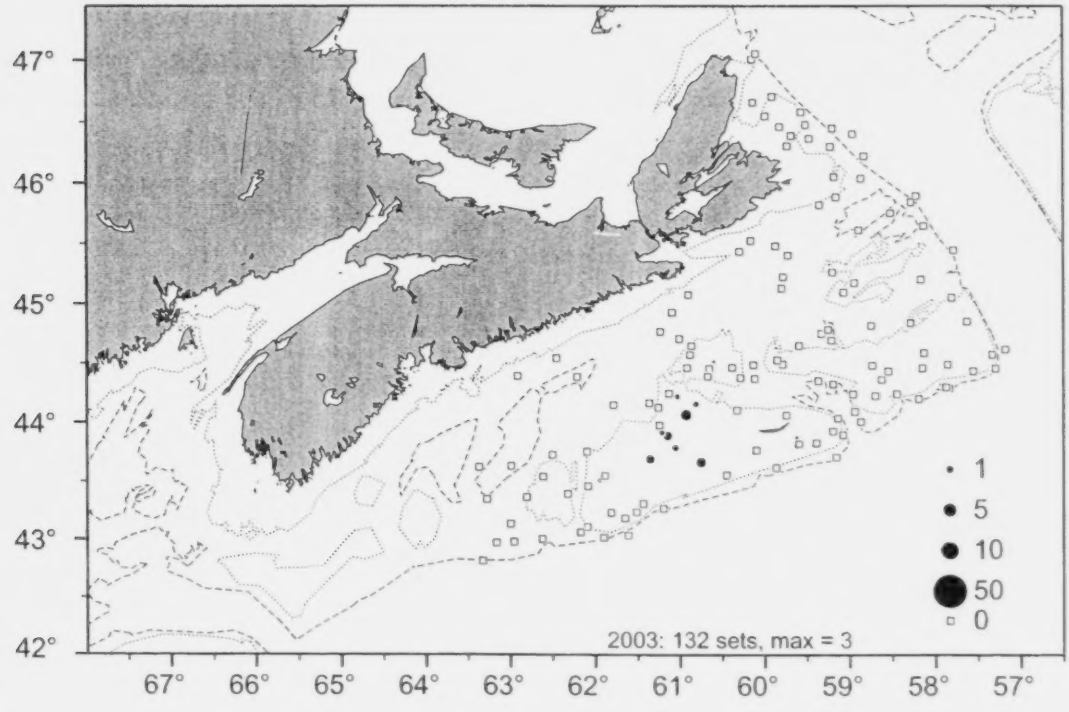


Fig. 48. 4VW Winter Flounder Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

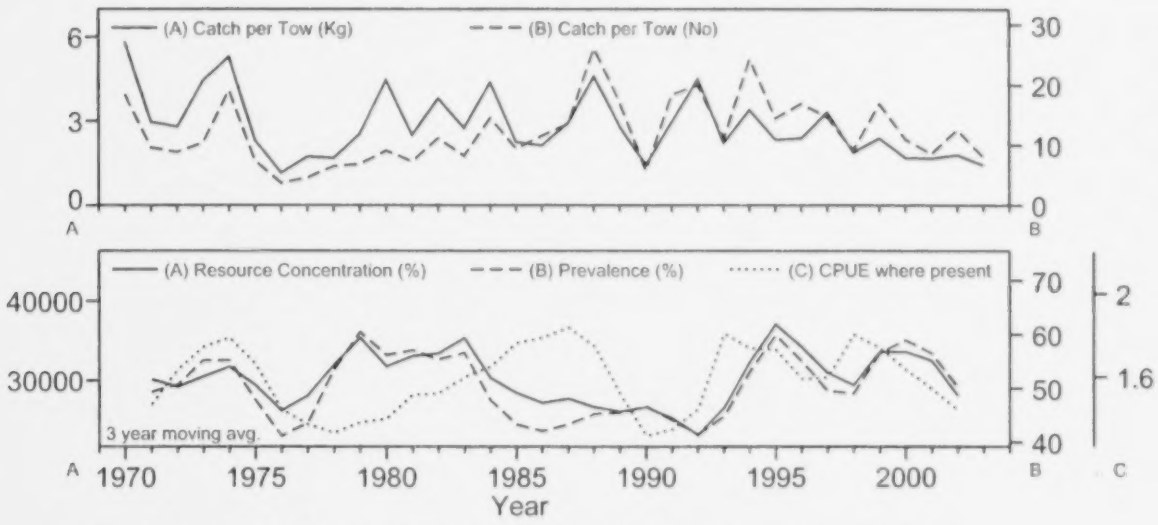


Fig. 49. 4X American Plaice stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

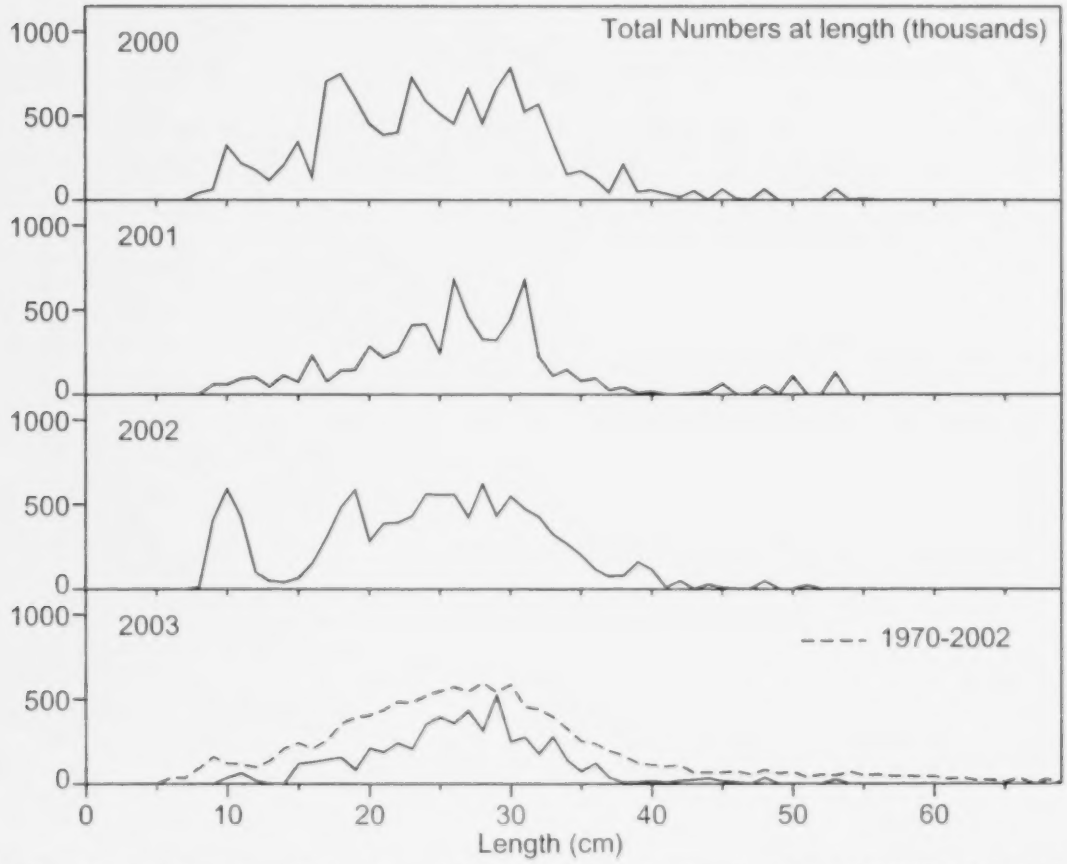


Fig. 50. 4X American Plaice length frequency distribution from the SUMMER Groundfish surveys.

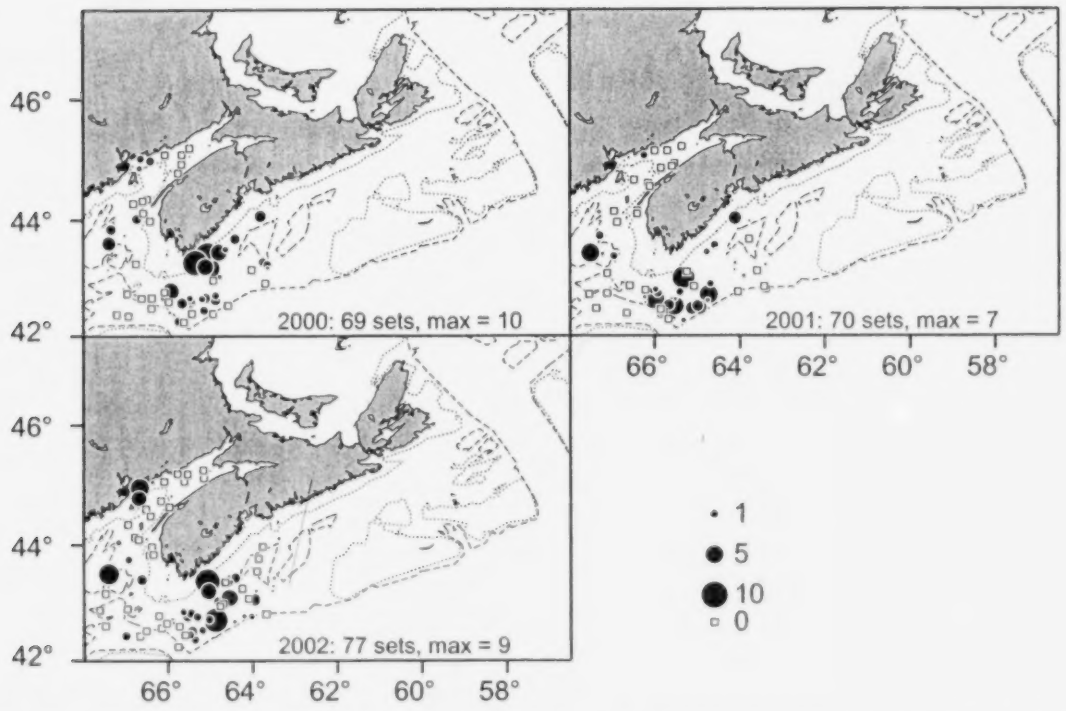


Fig. 51. 4X American Plaice Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

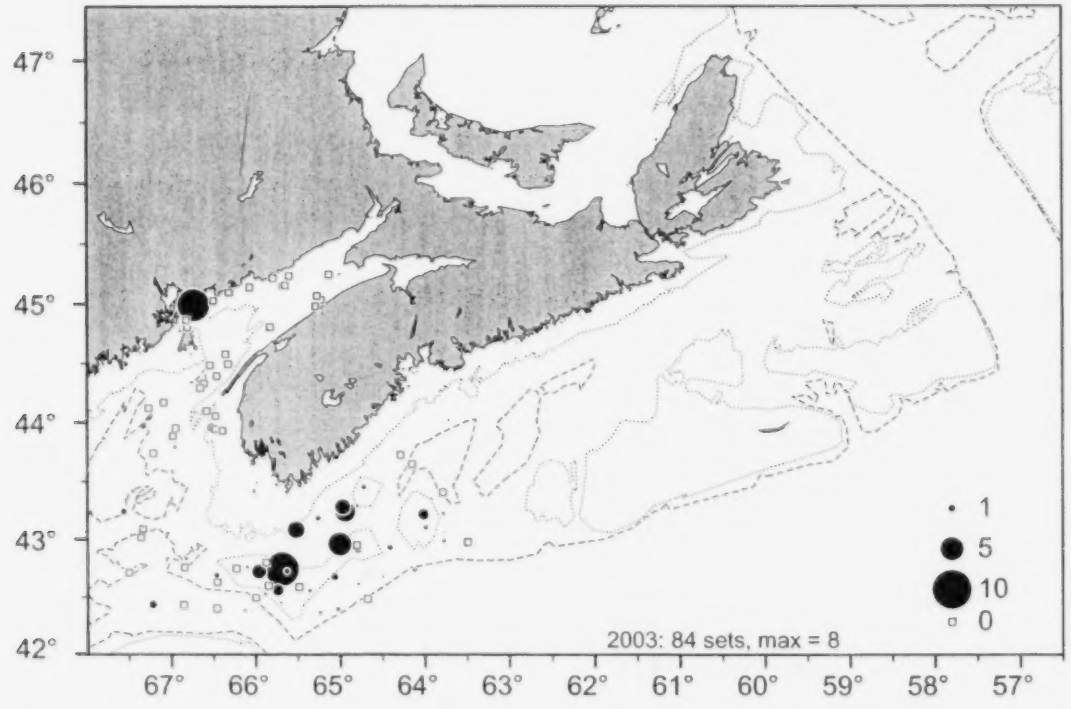


Fig. 52. 4X American Plaice Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

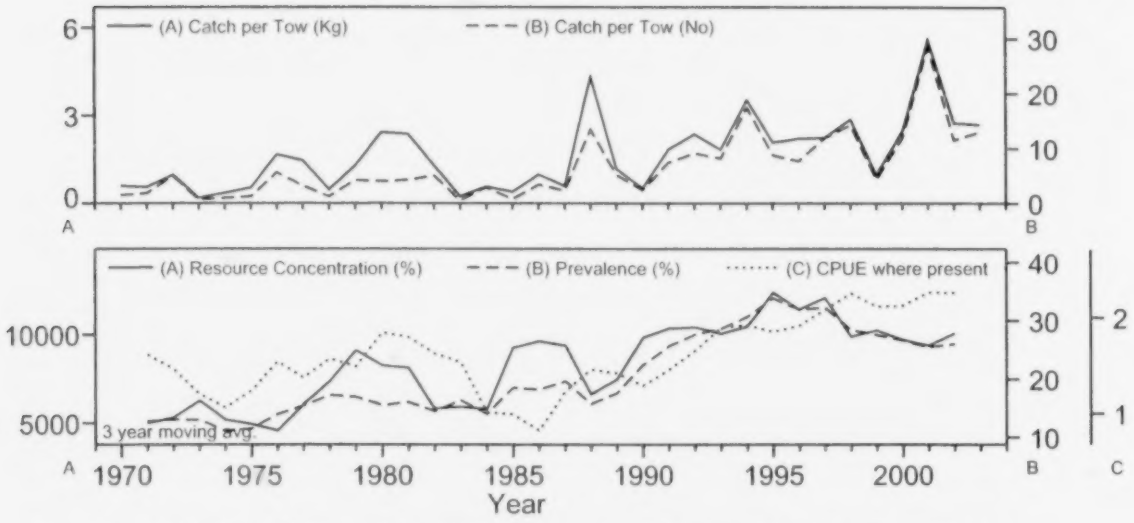


Fig. 53. 4X Yellowtail Flounder stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

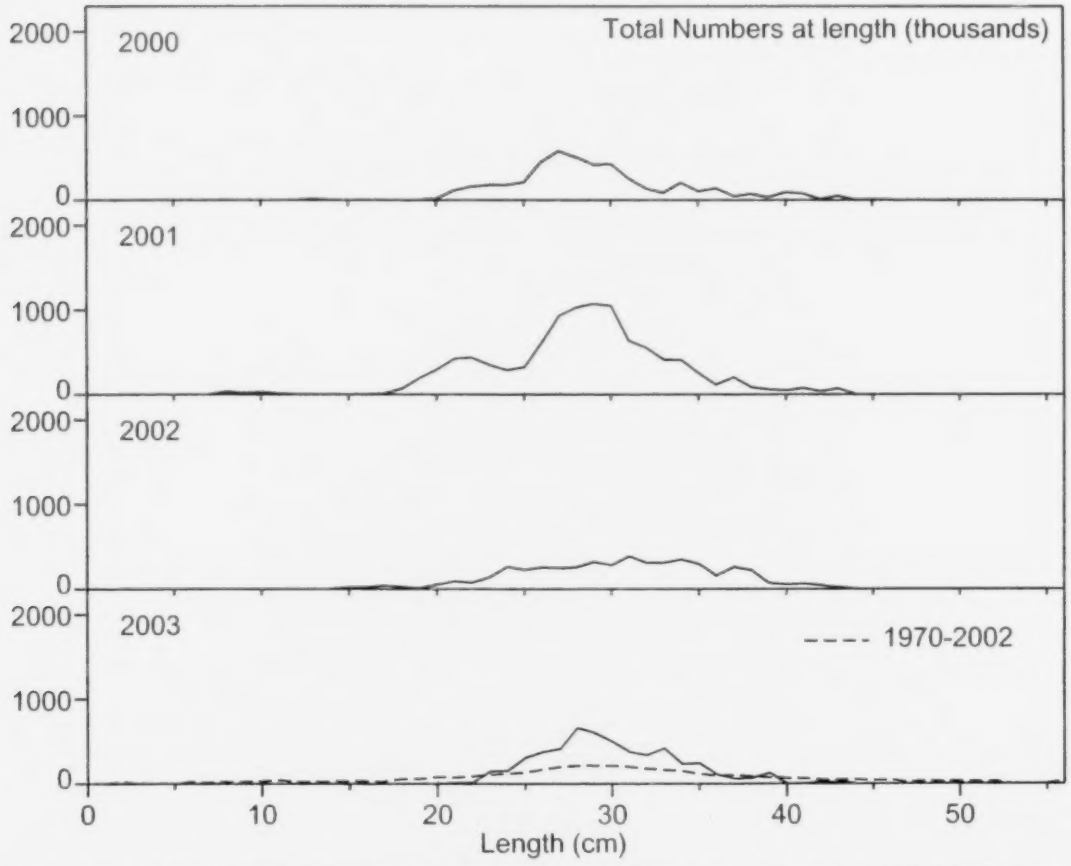


Fig. 54. 4X Yellowtail Flounder length frequency distribution from the SUMMER Groundfish surveys.

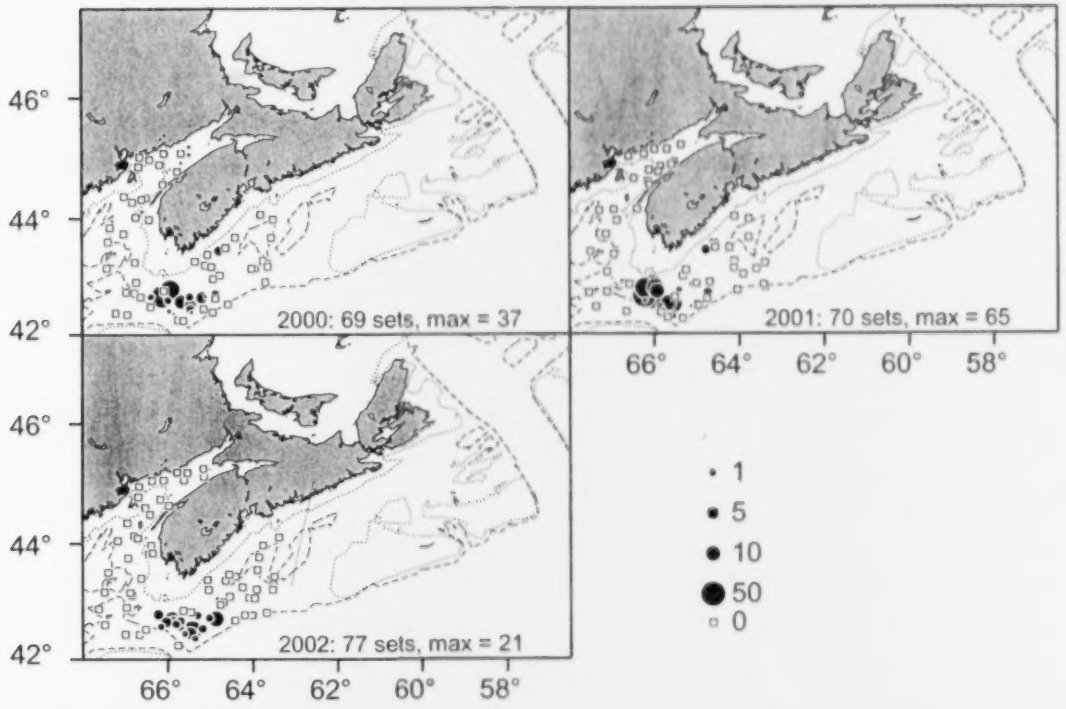


Fig. 55. 4X Yellowtail Flounder Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

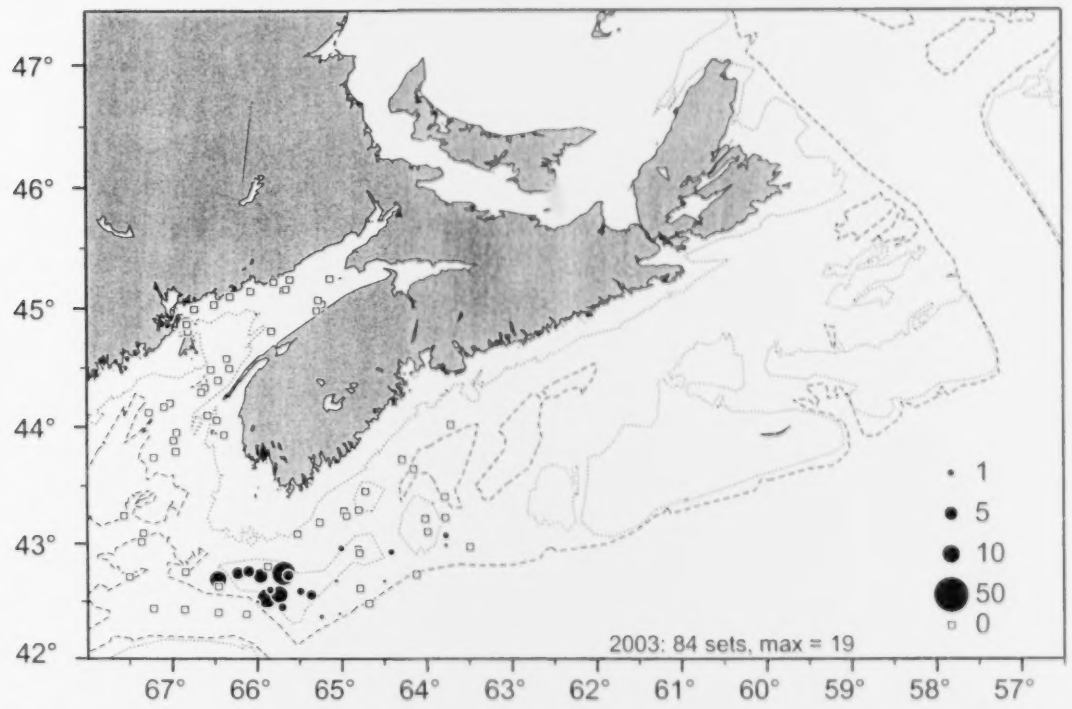


Fig. 56. 4X Yellowtail Flounder Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

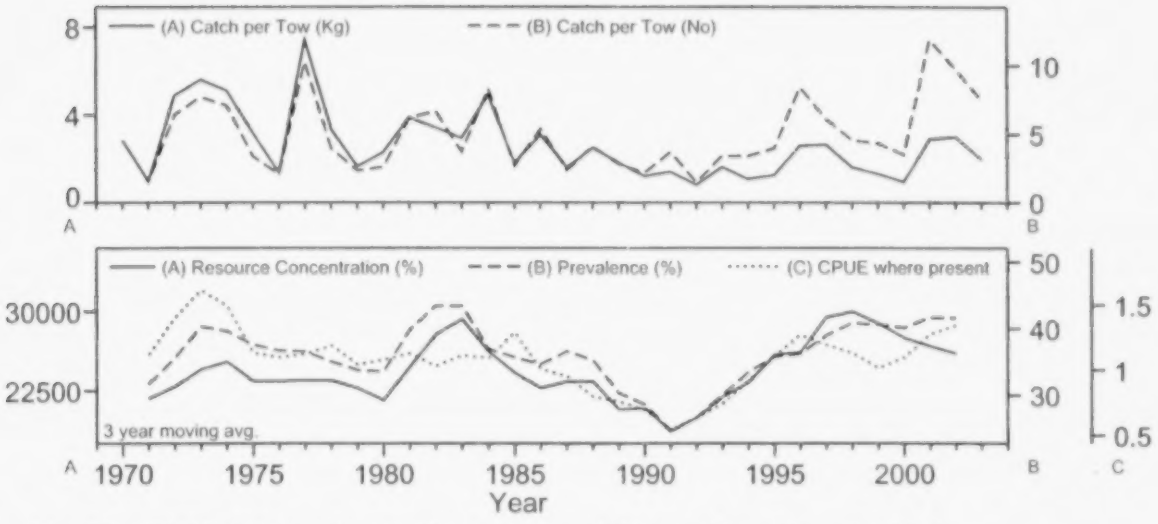


Fig. 57. 4X Witch Flounder stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

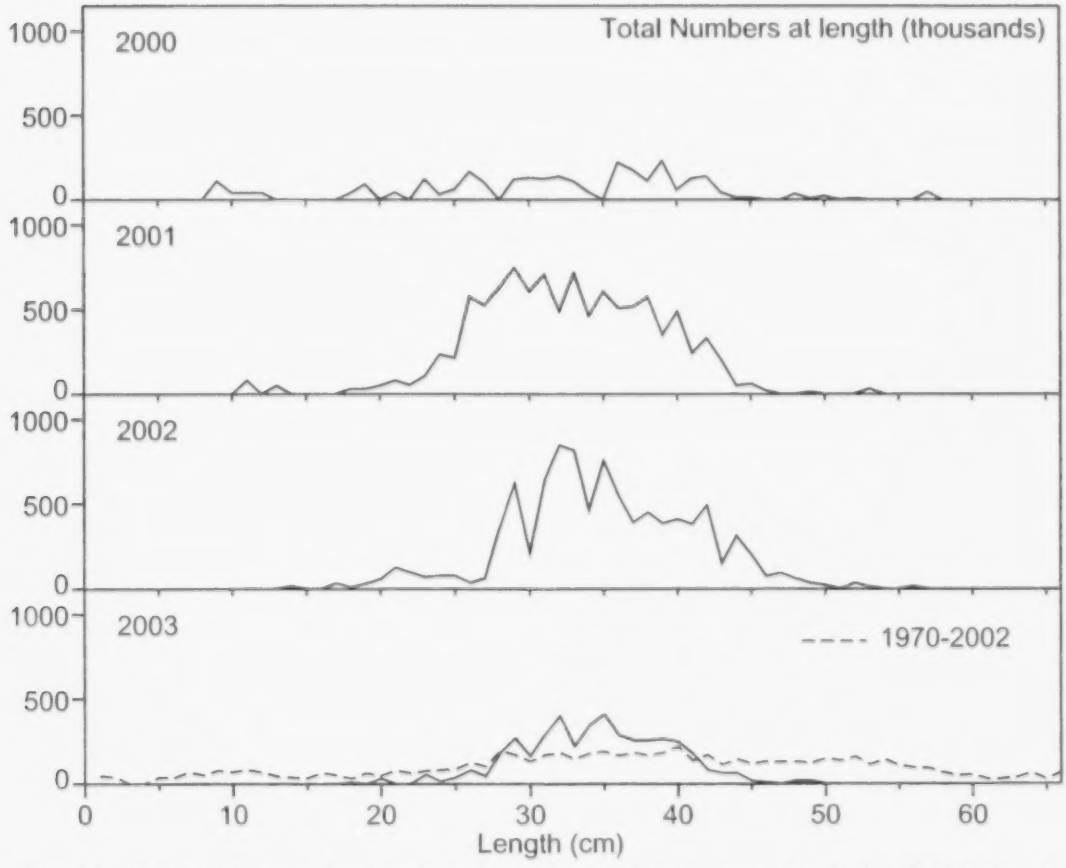


Fig. 58. 4X Witch Flounder length frequency distribution from the SUMMER Groundfish surveys.

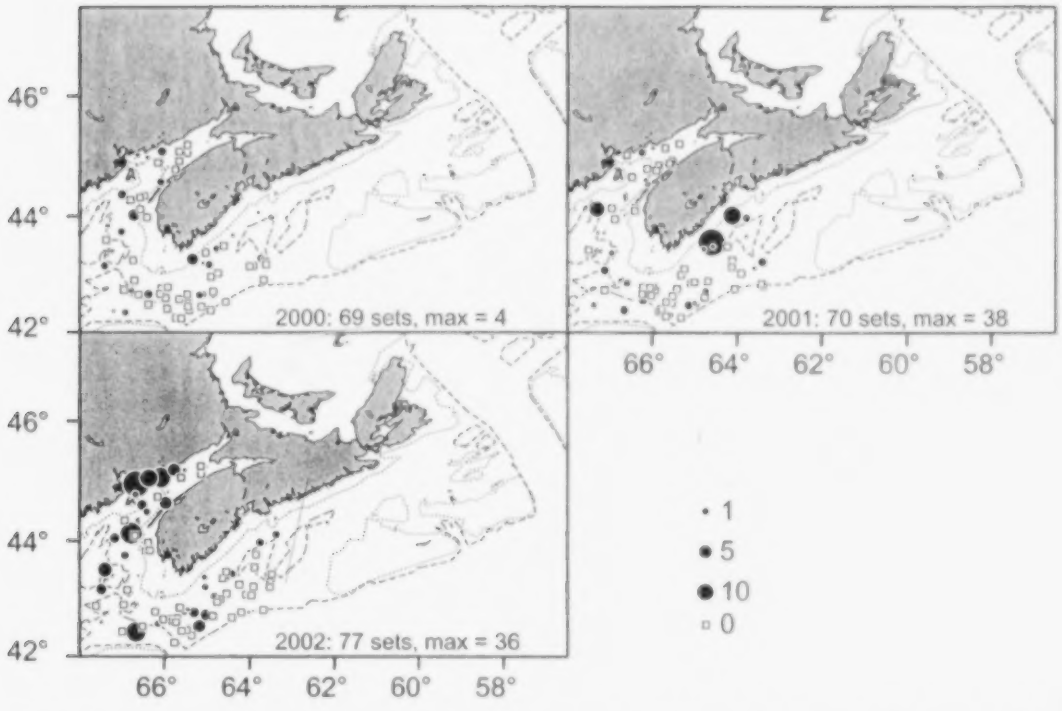


Fig. 59. 4X Witch Flounder Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

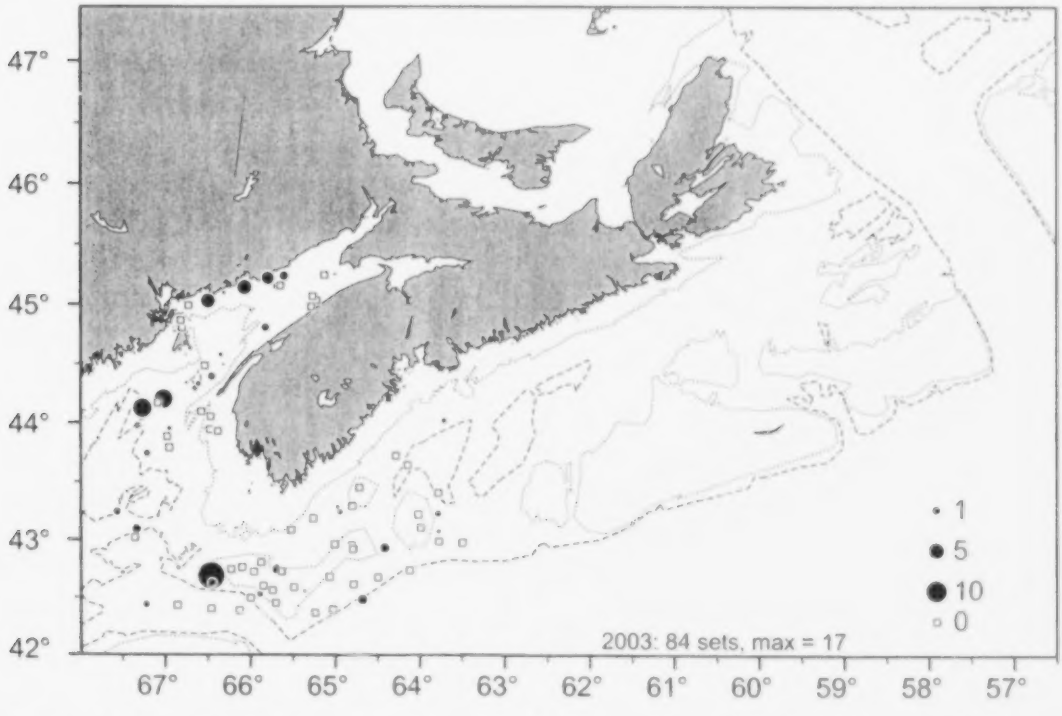


Fig. 60. 4X Witch Flounder Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

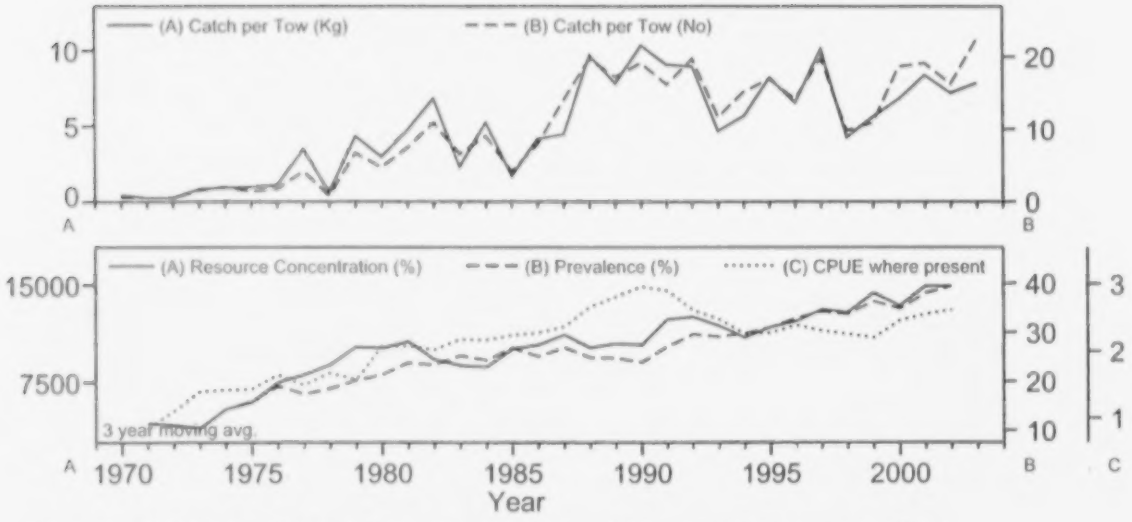


Fig. 61. 4X Winter Flounder stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

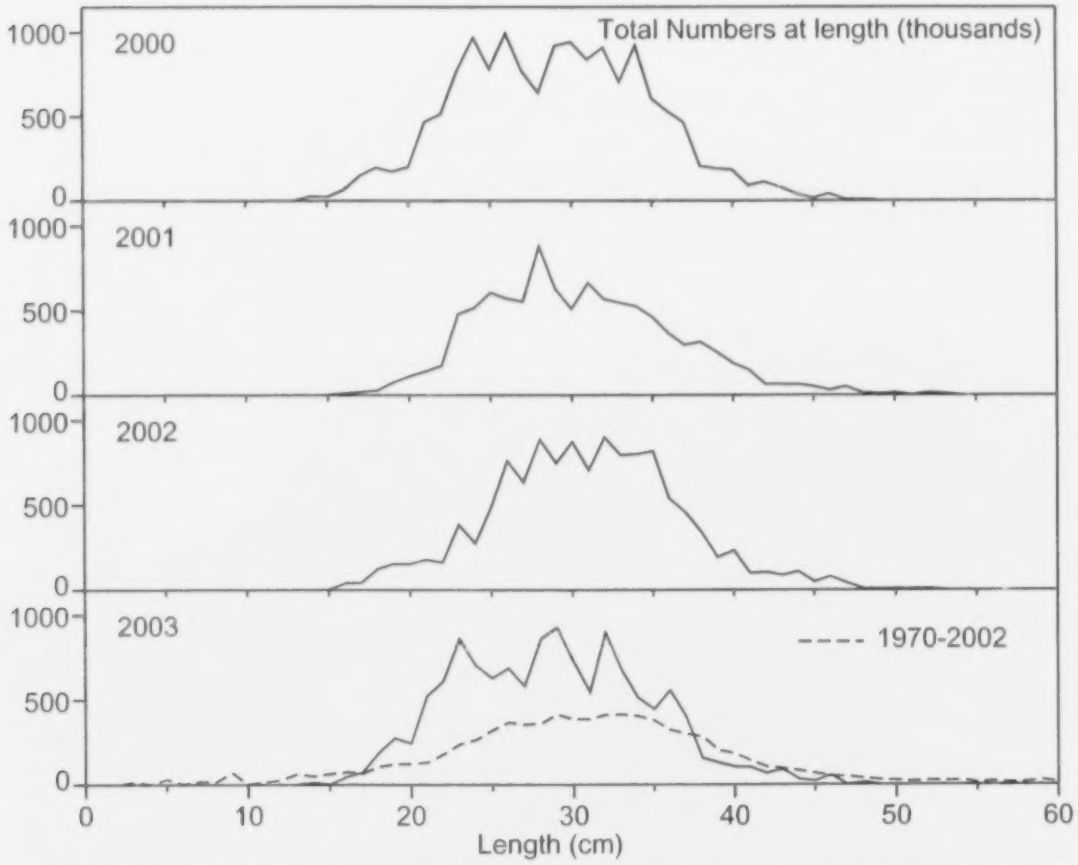


Fig. 62. 4X Winter Flounder length frequency distribution from the SUMMER Groundfish surveys.

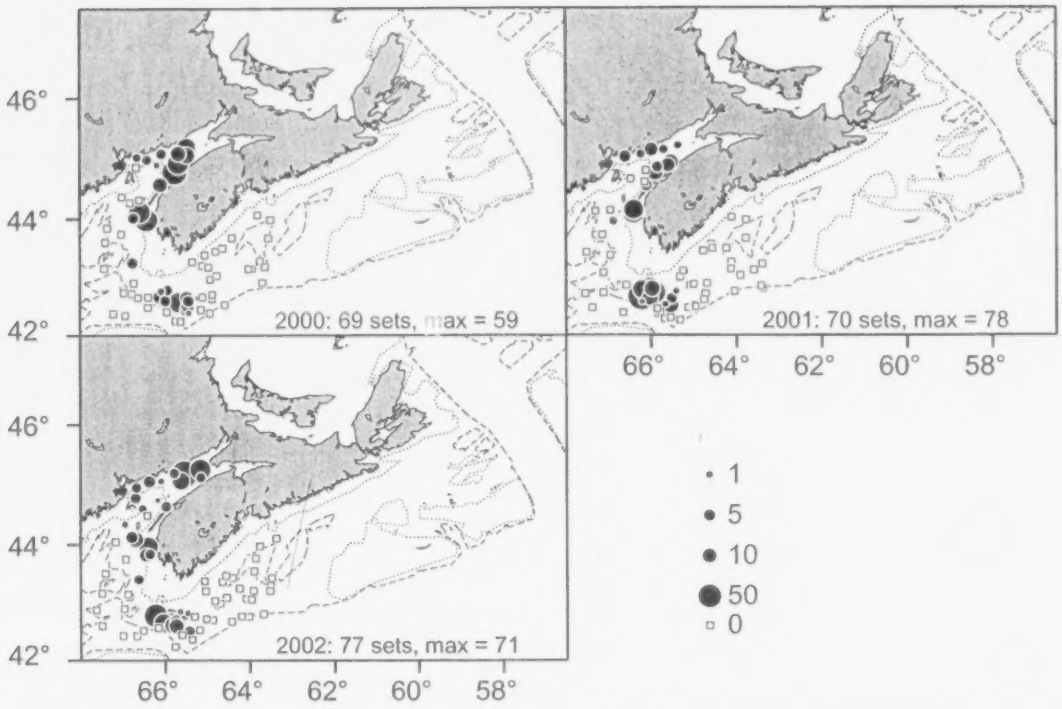


Fig. 63. 4X Winter Flounder Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

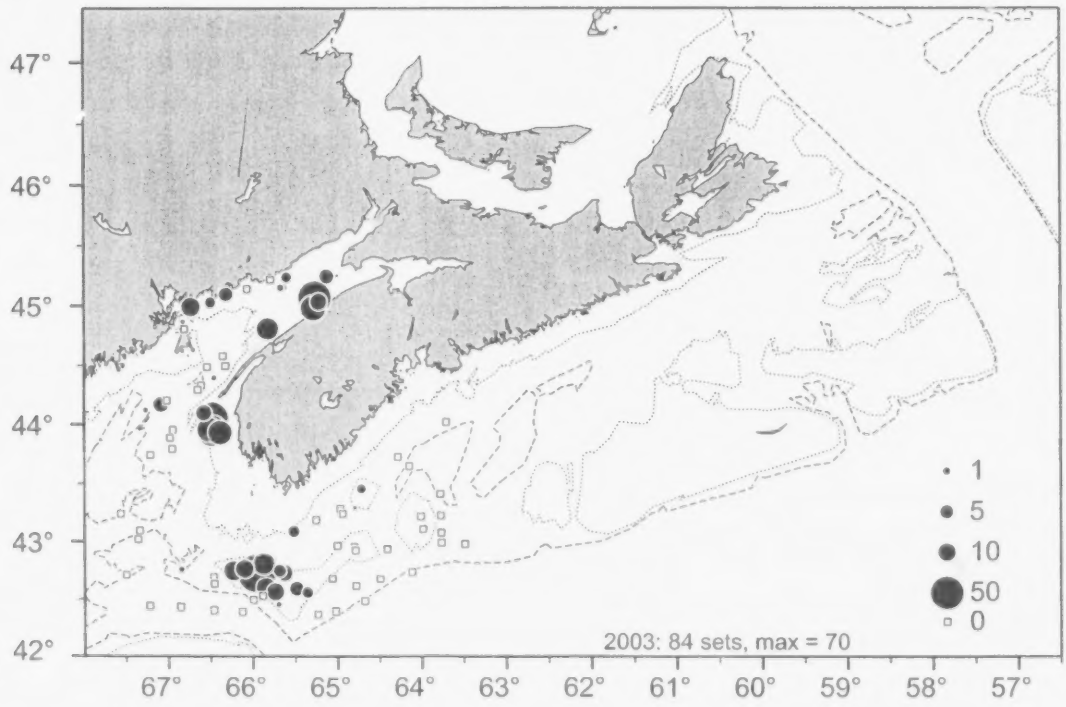


Fig. 64. 4X Winter Flounder Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

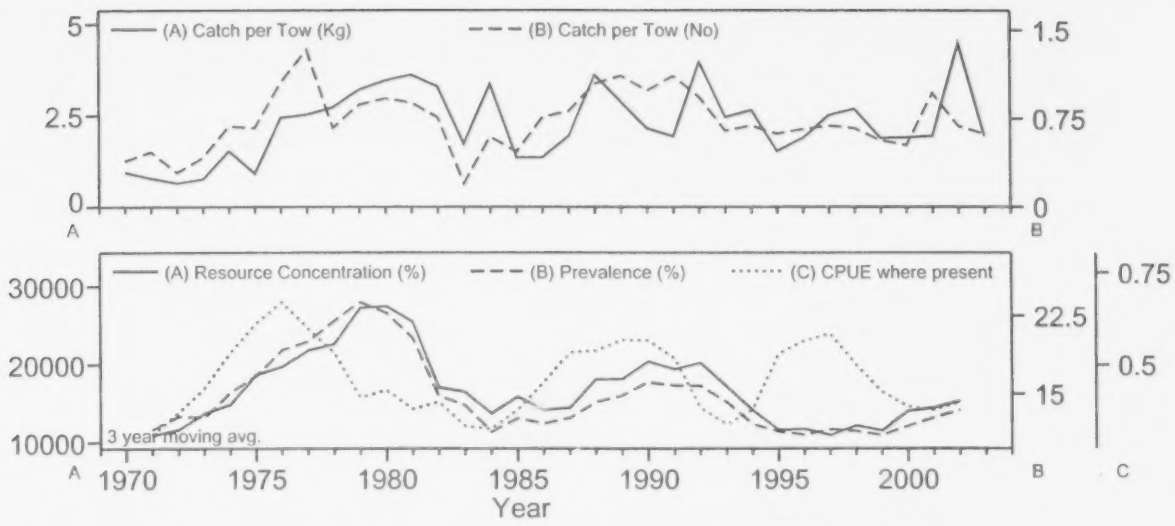


Fig. 65. 4VWX Halibut stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

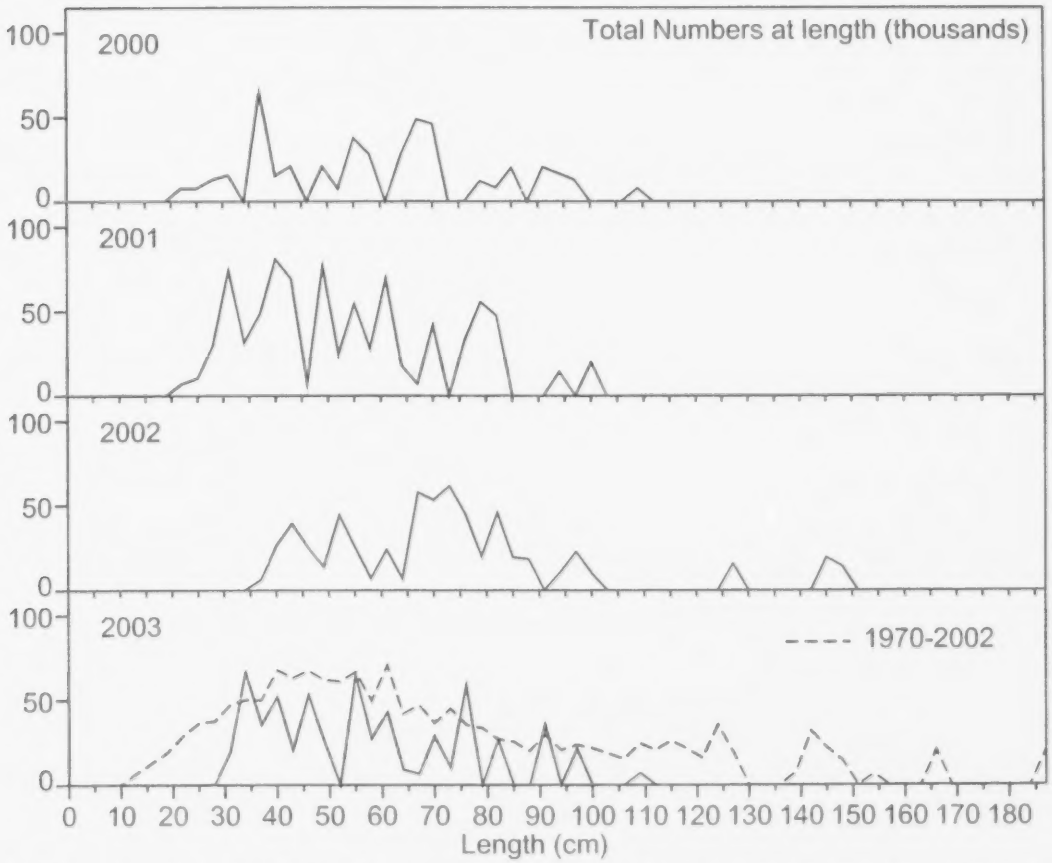


Fig. 66. 4VWX Halibut length frequency distribution from the SUMMER Groundfish surveys.

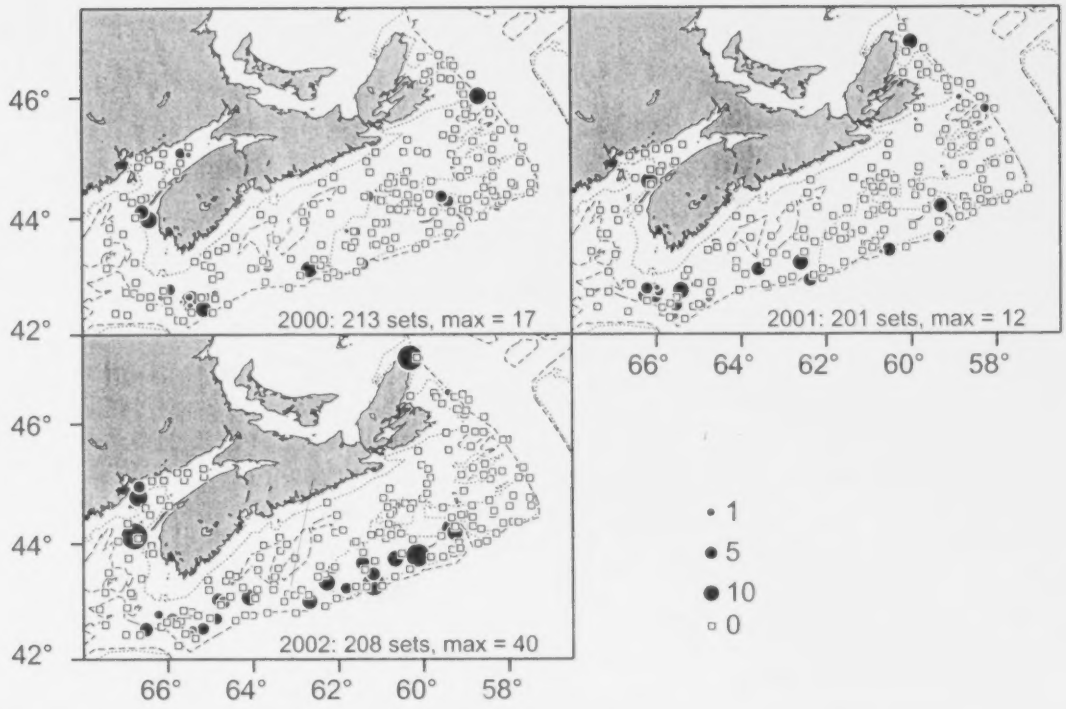


Fig. 67. 4VWX Halibut Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

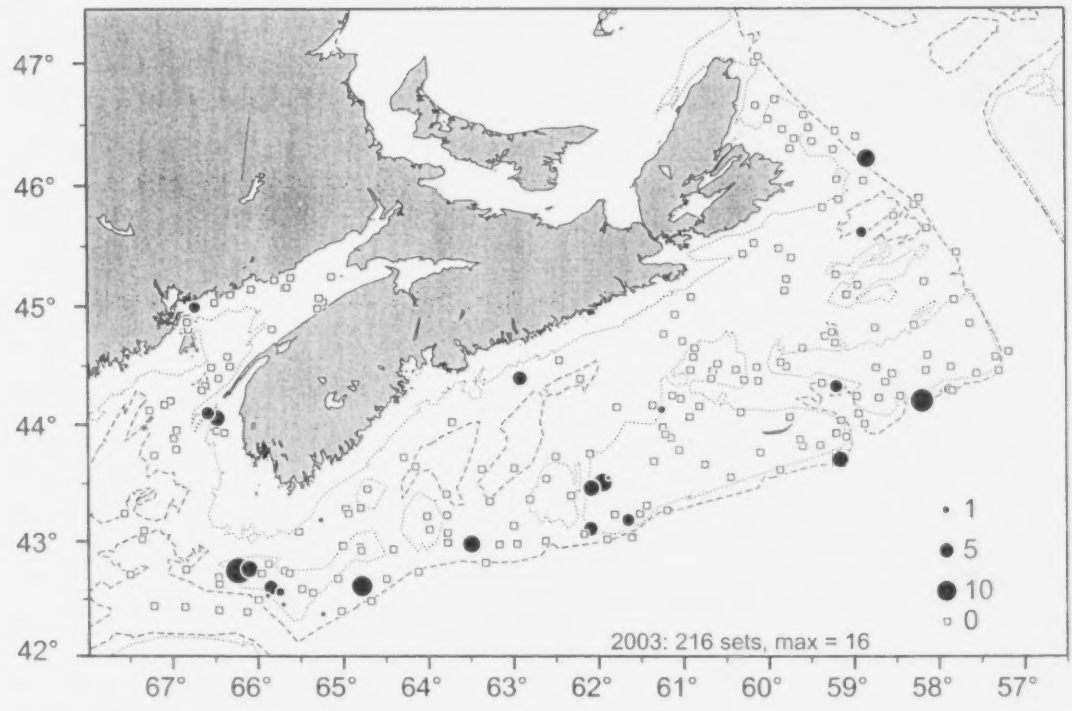


Fig. 68. 4VWX Halibut Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

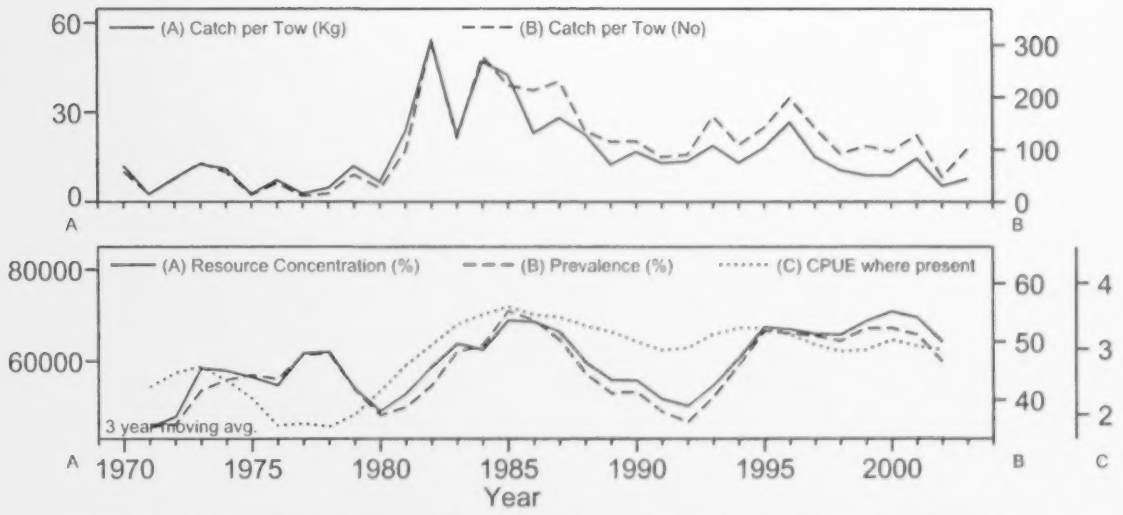


Fig. 69. 4VWX-484/495 Silver Hake stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

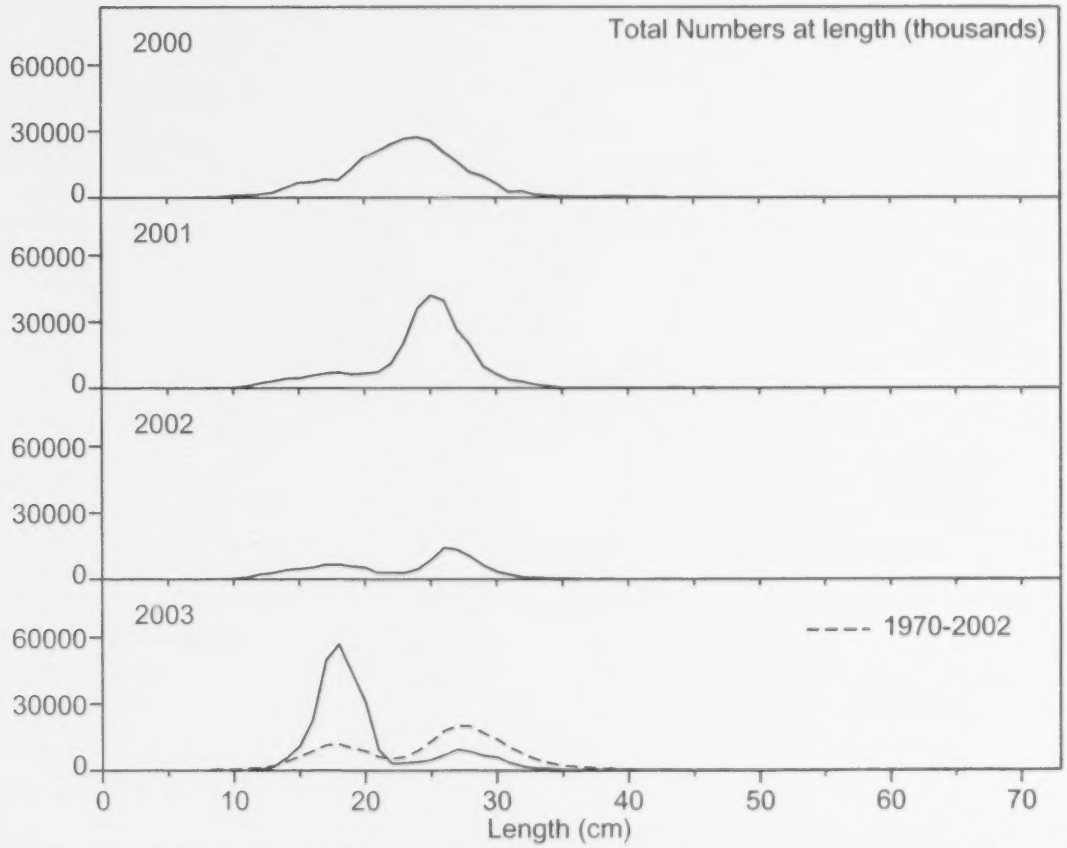


Fig. 70. 4VWX-484/495 Silver Hake length frequency distribution from the SUMMER Groundfish surveys.

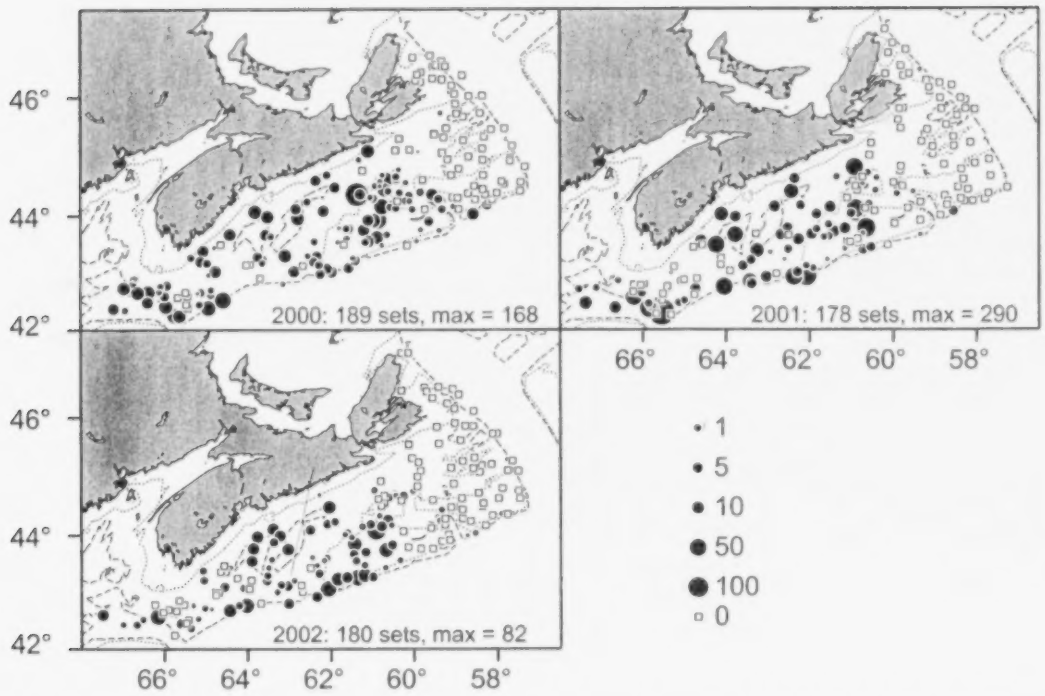


Fig. 71. 4VWX-484/495 Silver Hake Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

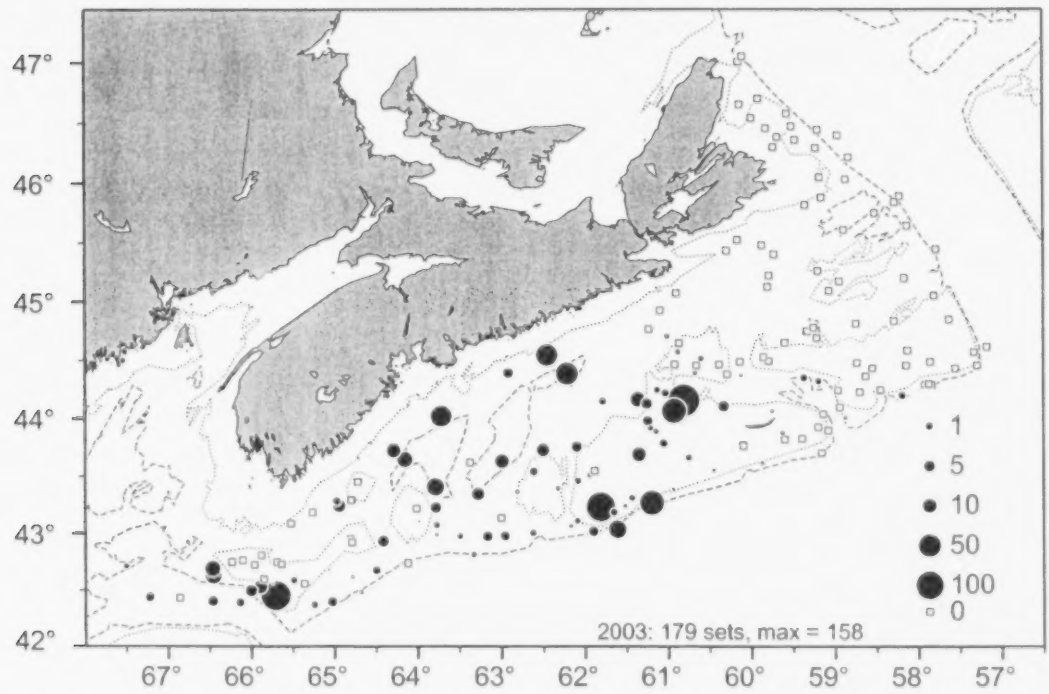


Fig. 72. 4VWX-484/495 Silver Hake Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

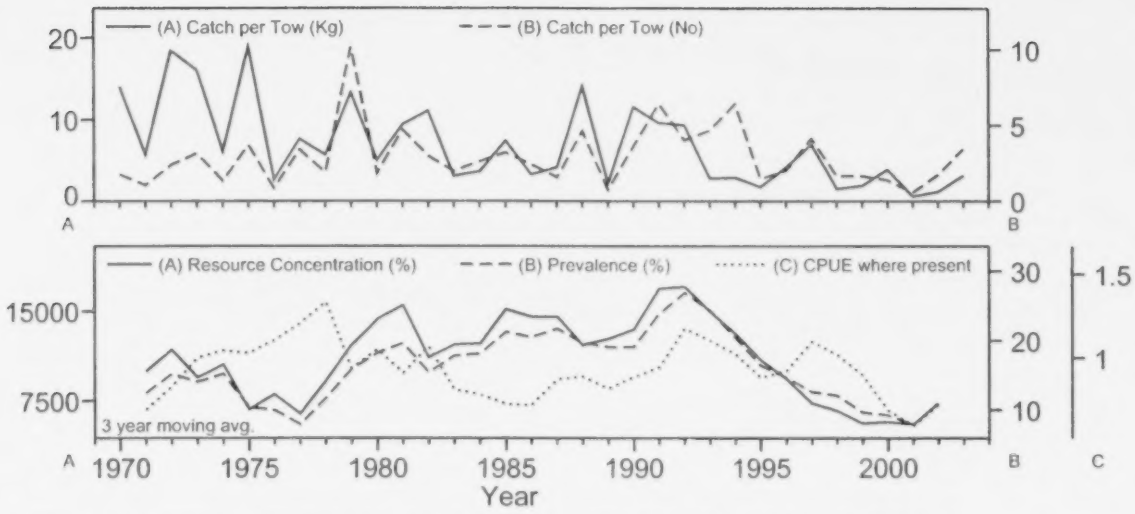


Fig. 73. 4VsW Winter Skate stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

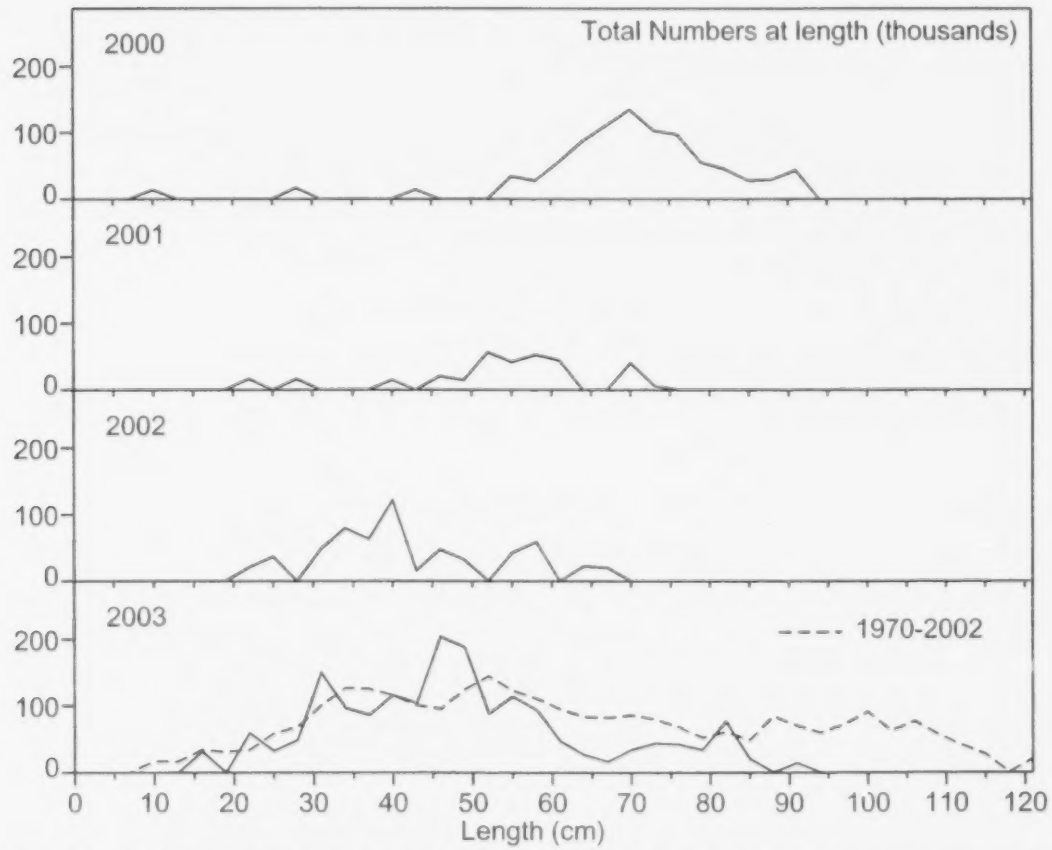


Fig. 74. 4VsW Winter Skate length frequency distribution from the SUMMER Groundfish surveys.

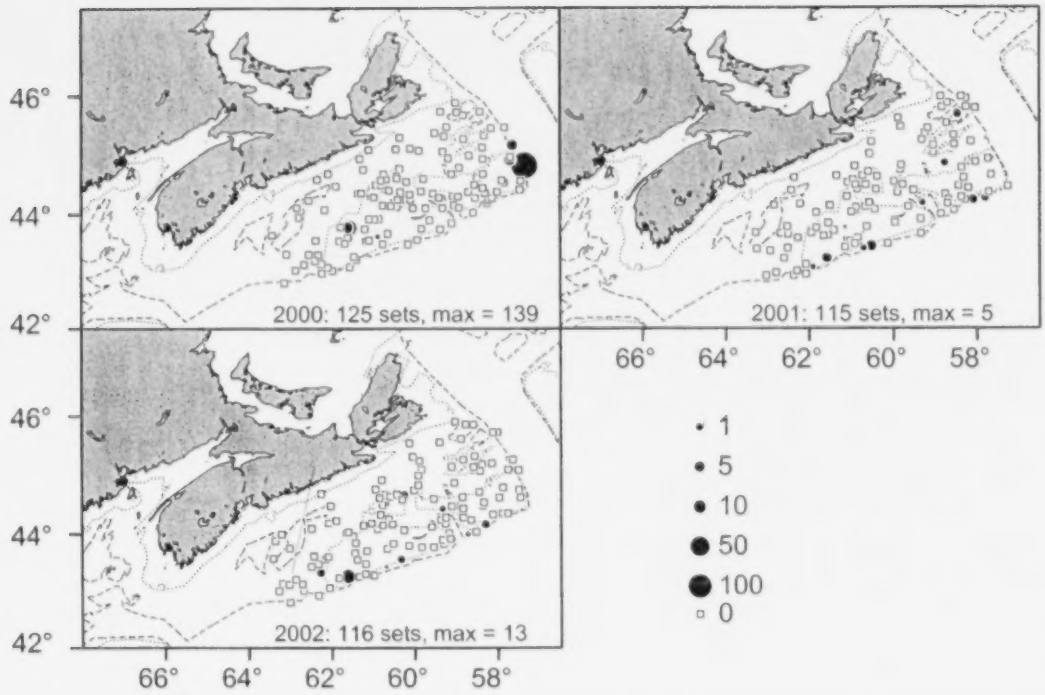


Fig. 75. 4VsW Winter Skate Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

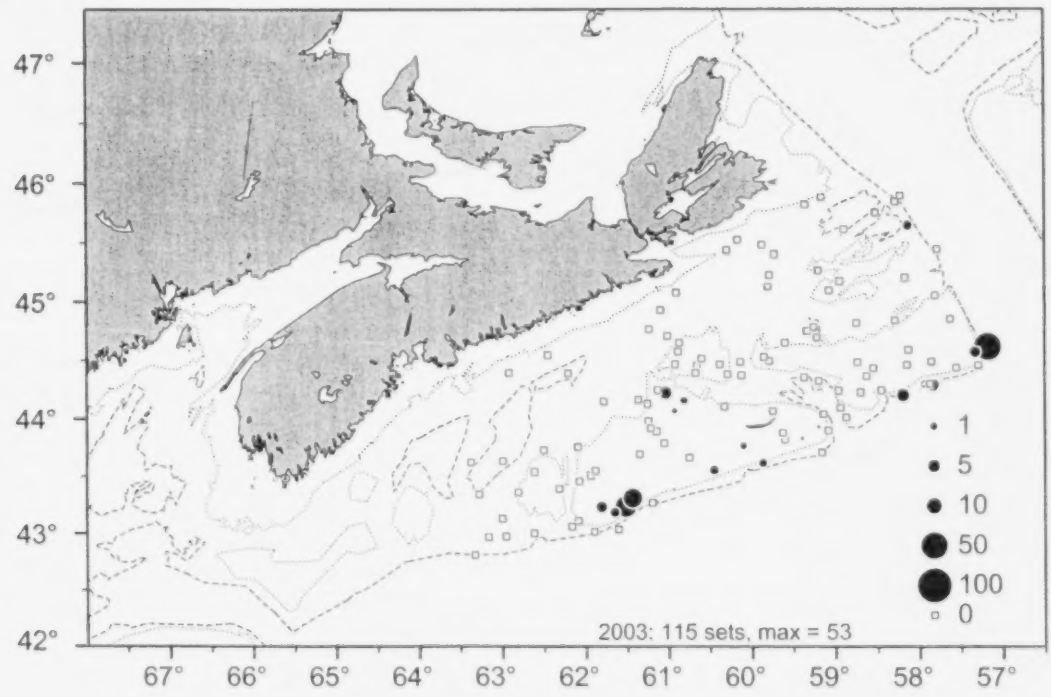


Fig. 76. 4VsW Winter Skate Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

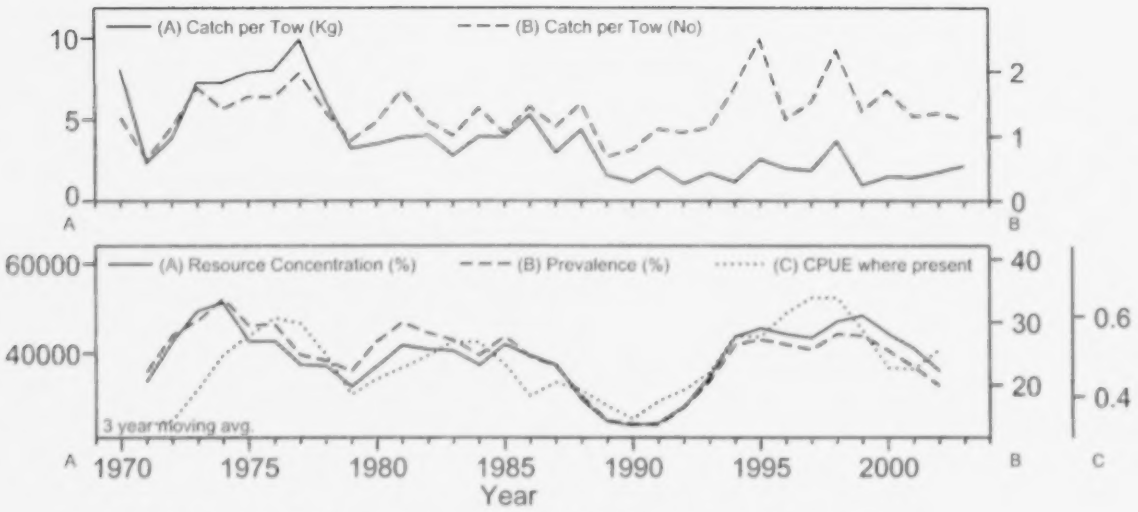


Fig. 77. 4VWX Monkfish stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

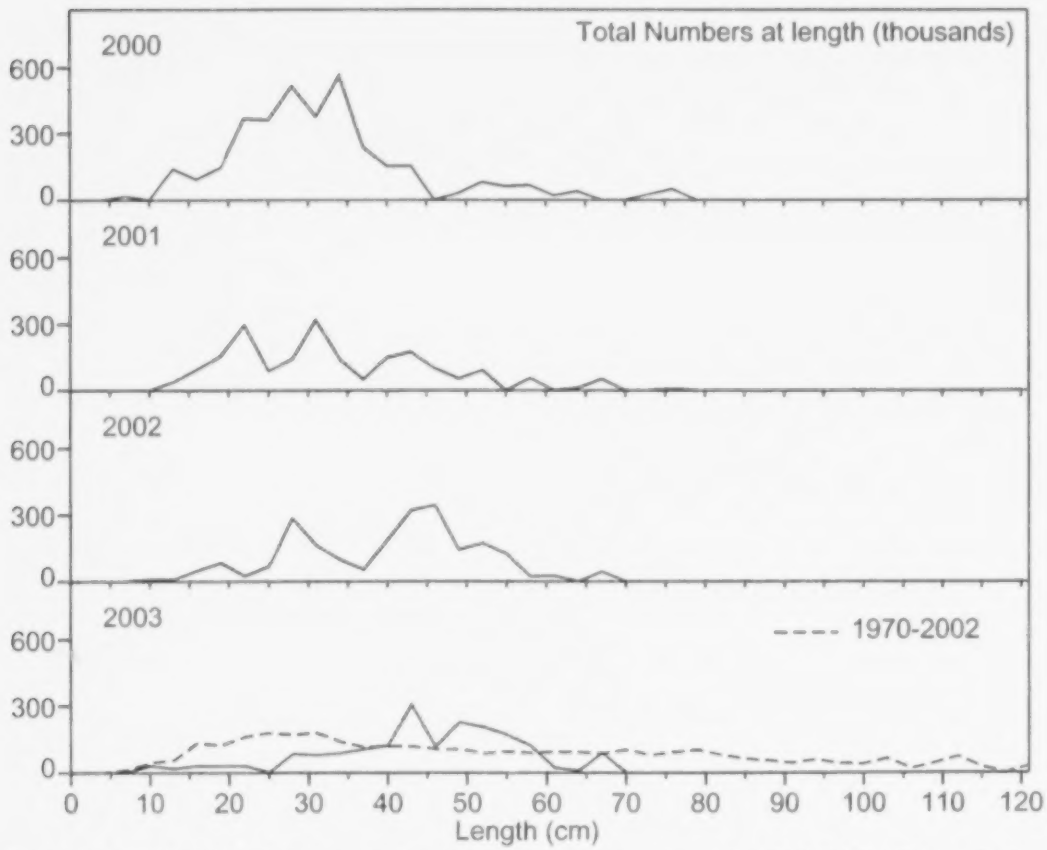


Fig. 78. 4VWX Monkfish length frequency distribution from the SUMMER Groundfish surveys.

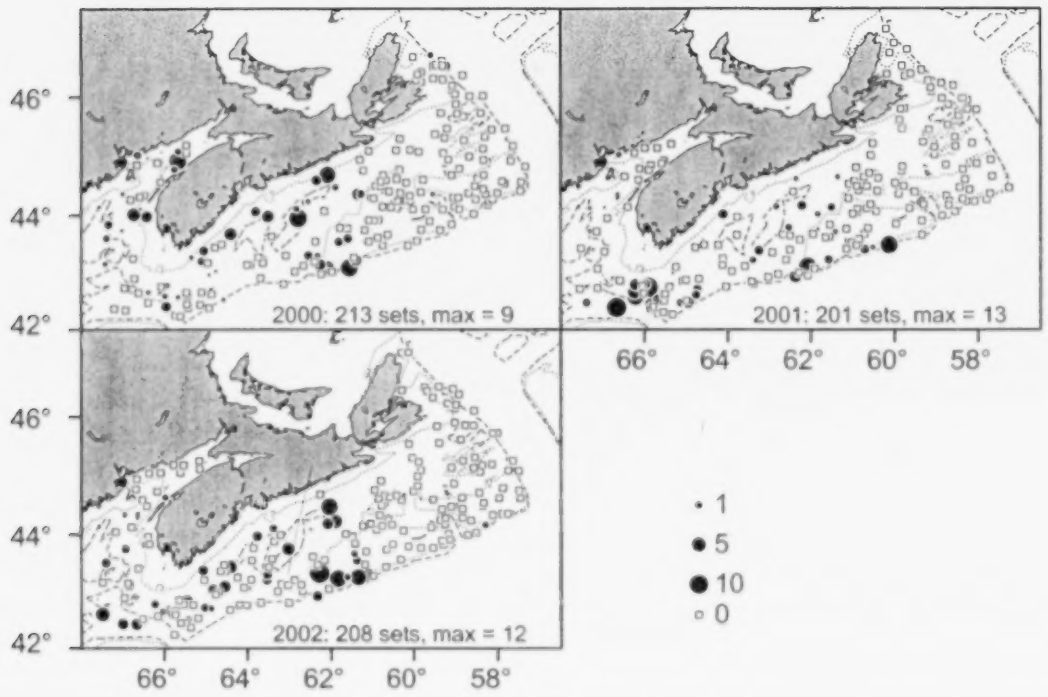


Fig. 79. 4VWX Monkfish Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

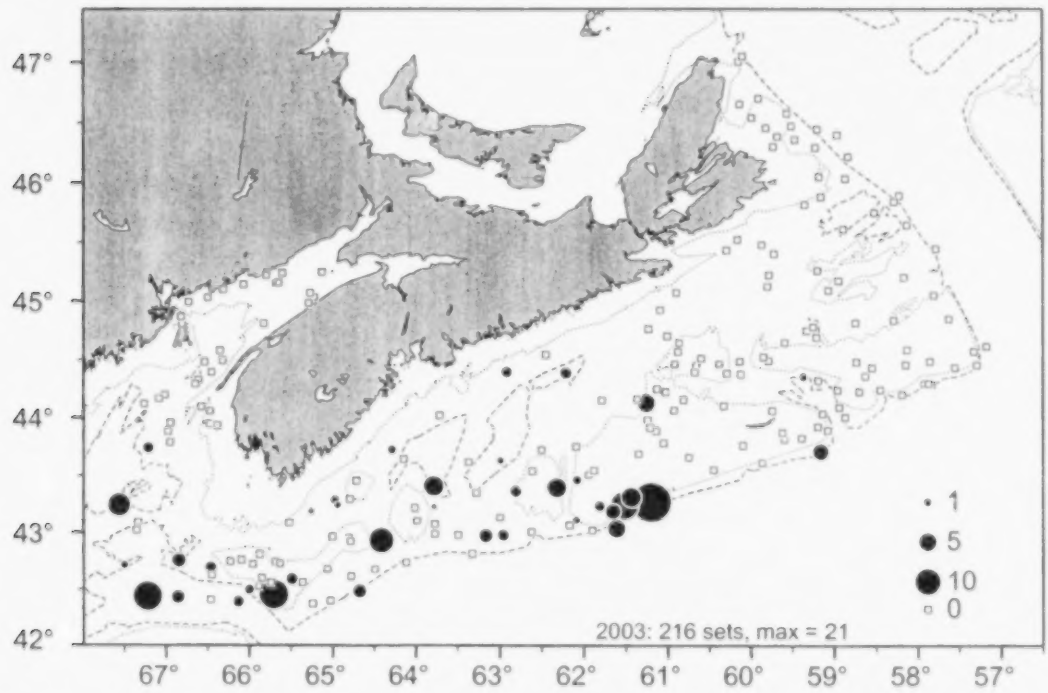


Fig. 80. 4VWX Monkfish Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

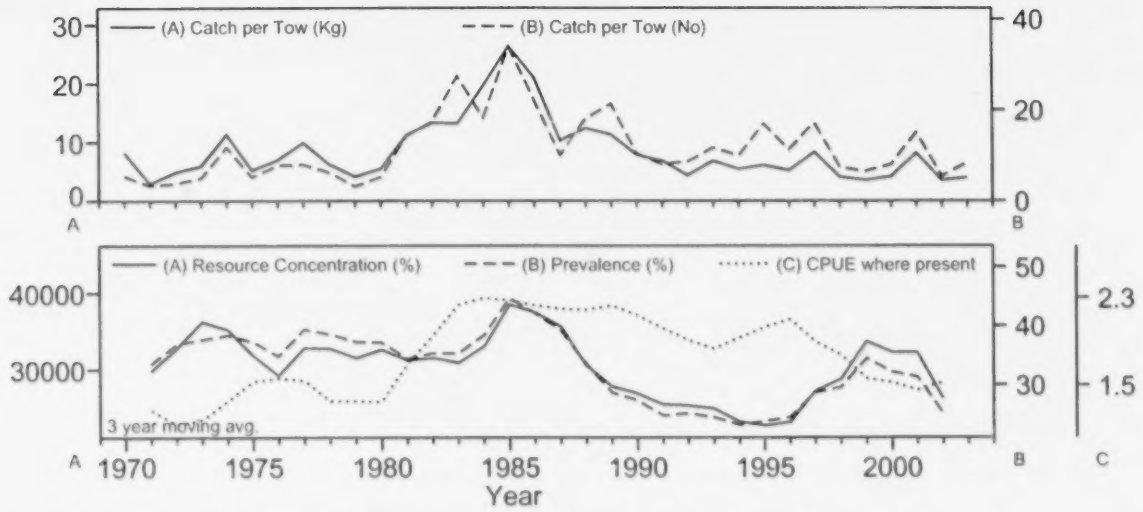


Fig. 81. 4VW White Hake stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

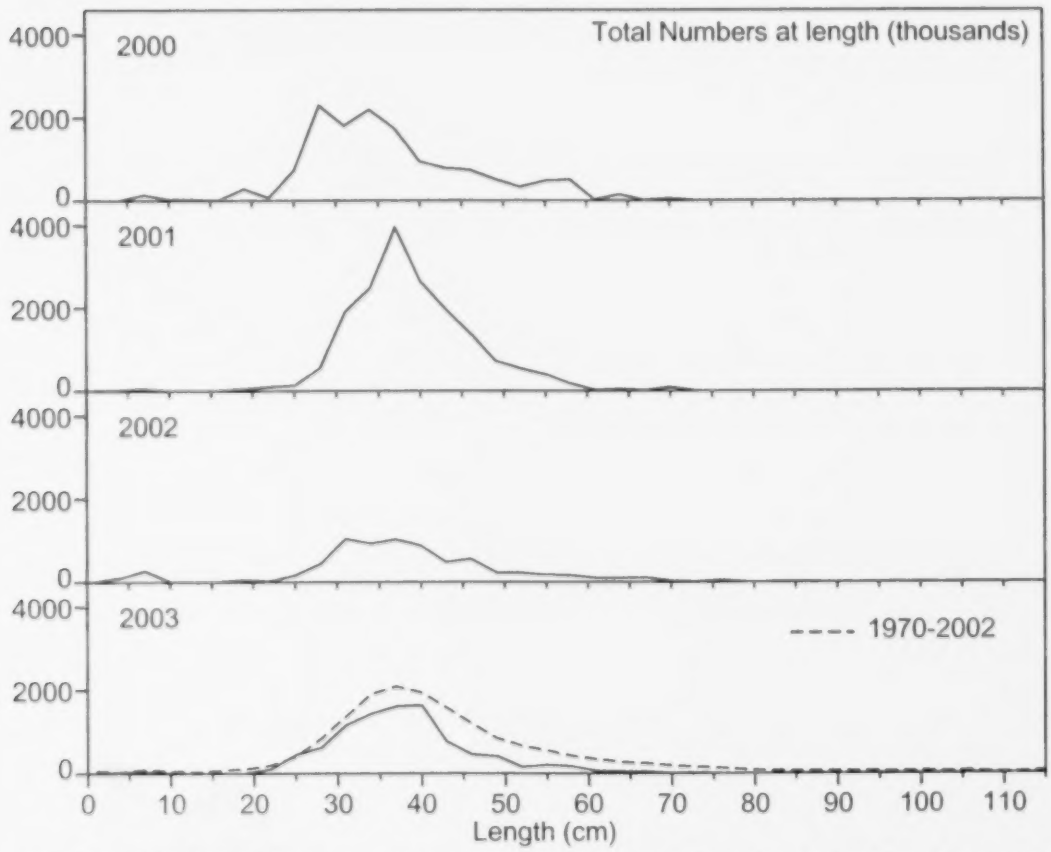


Fig. 82. 4VW White Hake length frequency distribution from the SUMMER Groundfish surveys.

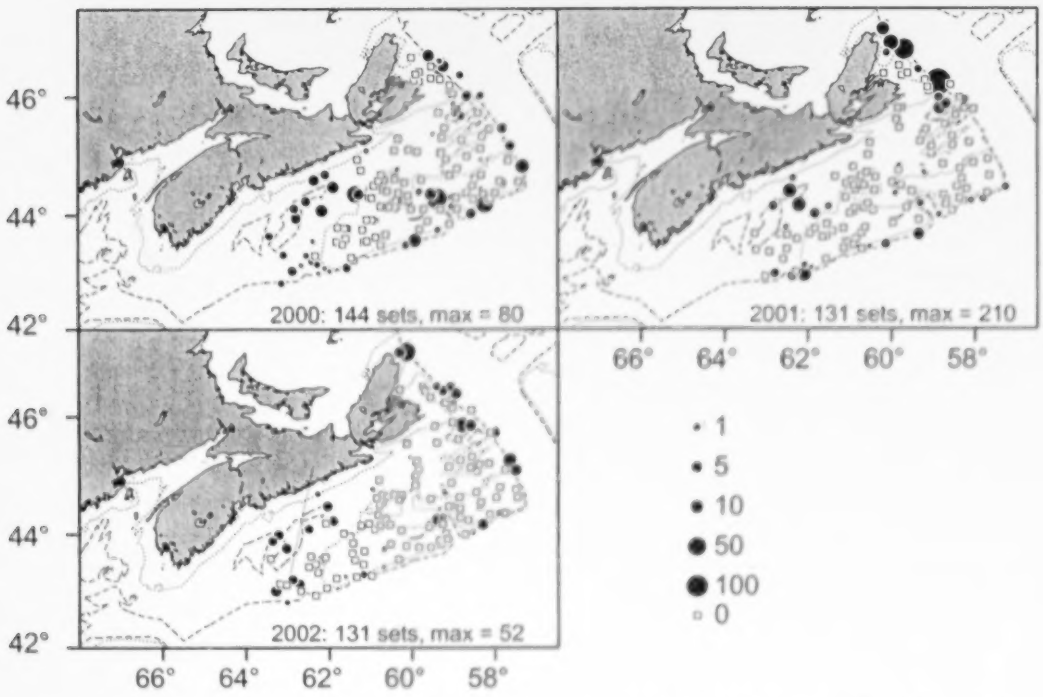


Fig. 83. 4VW White Hake Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

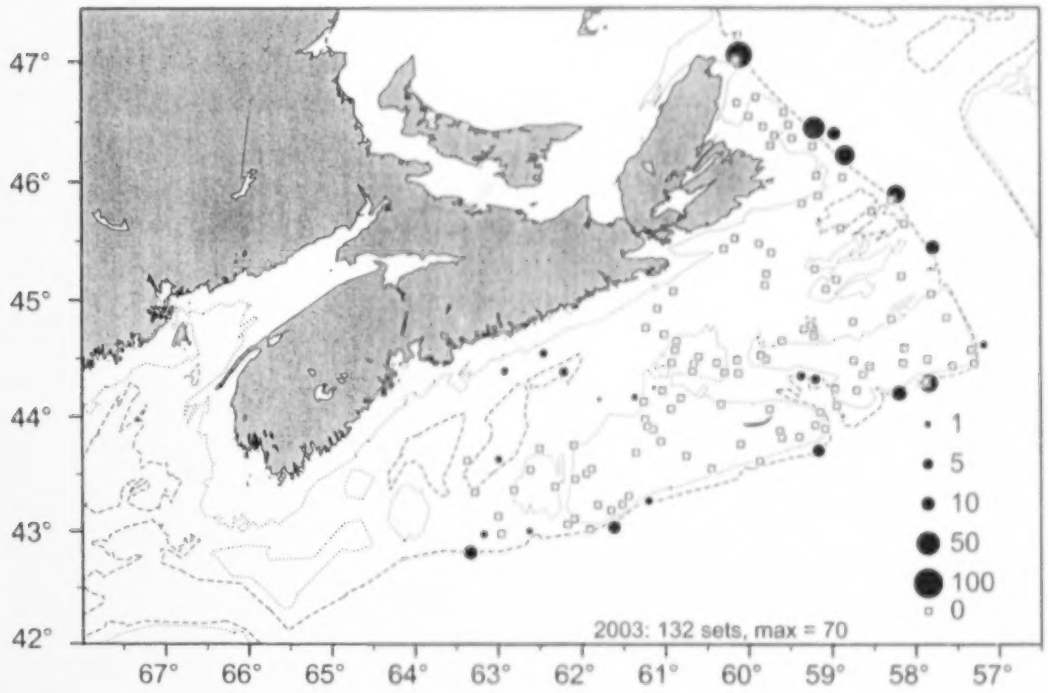


Fig. 84. 4VW White Hake Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

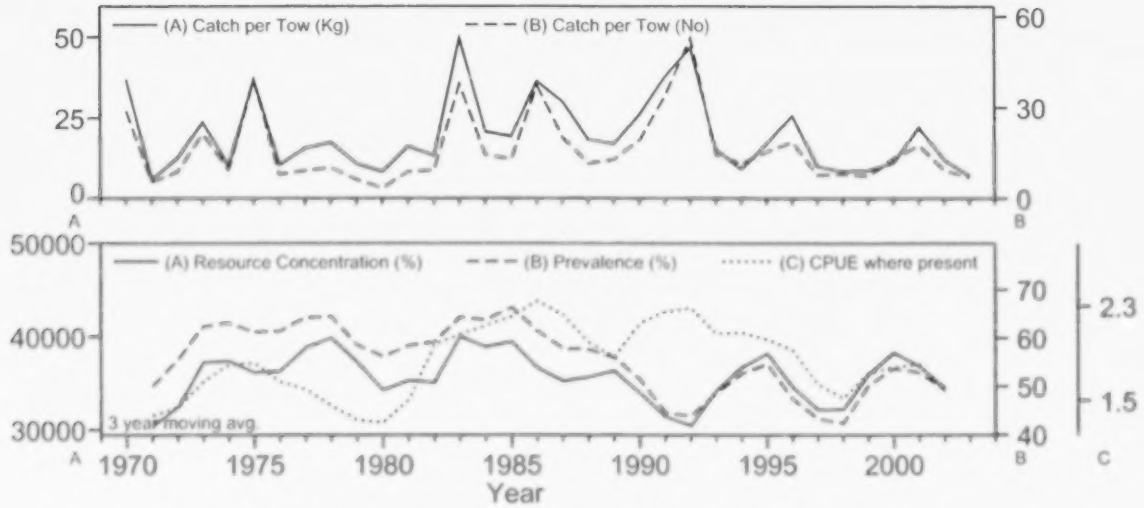


Fig. 85. 4X White Hake stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

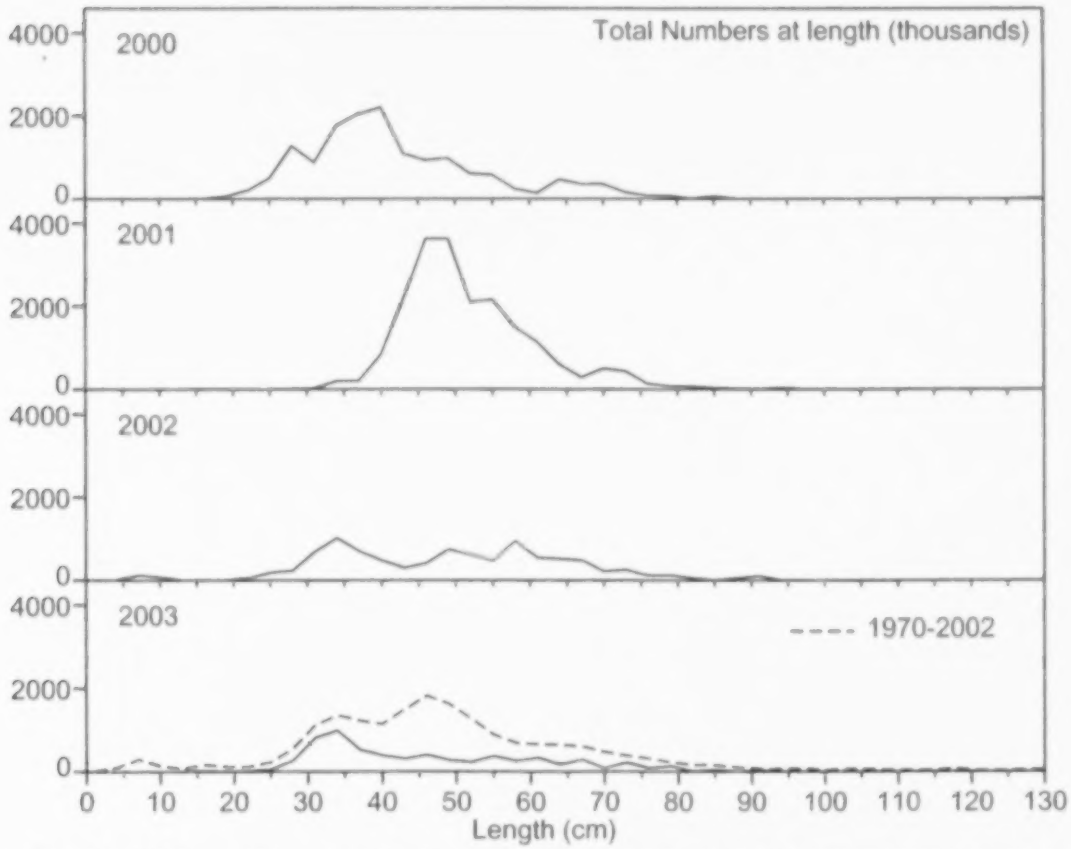


Fig. 86. 4X White Hake length frequency distribution from the SUMMER Groundfish surveys.

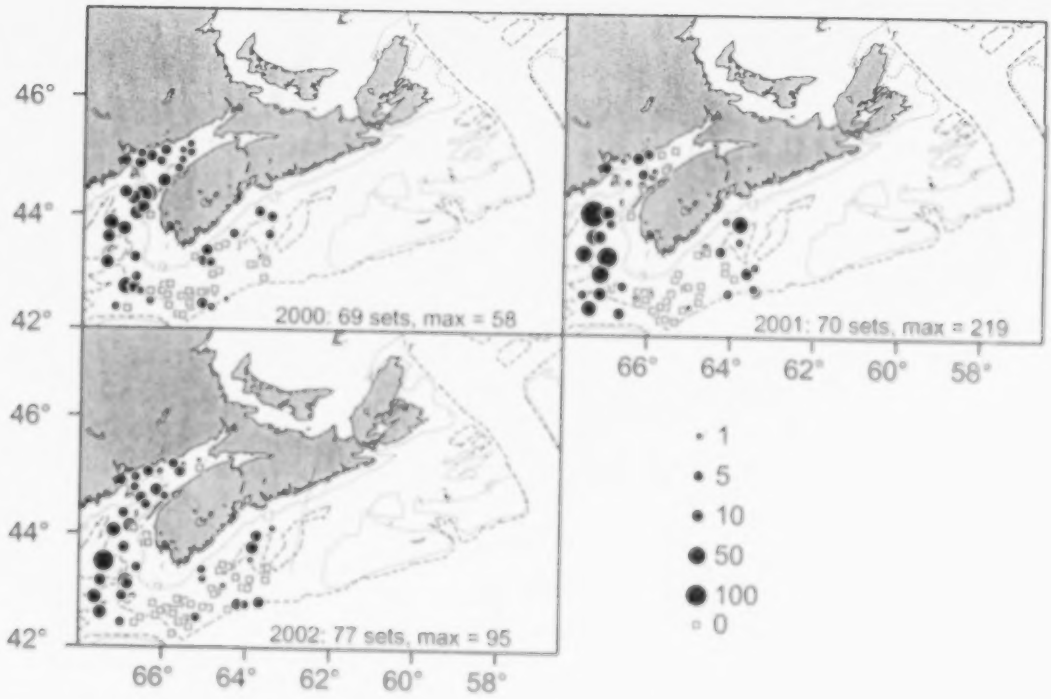


Fig. 87. 4X White Hake Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

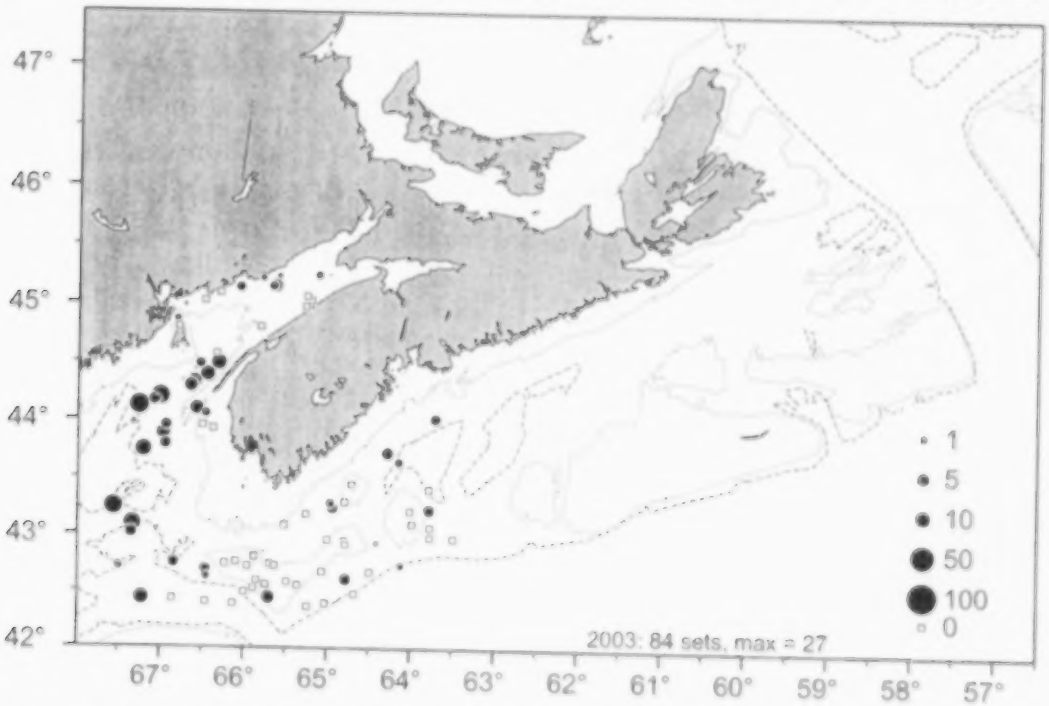


Fig. 88. 4X White Hake Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

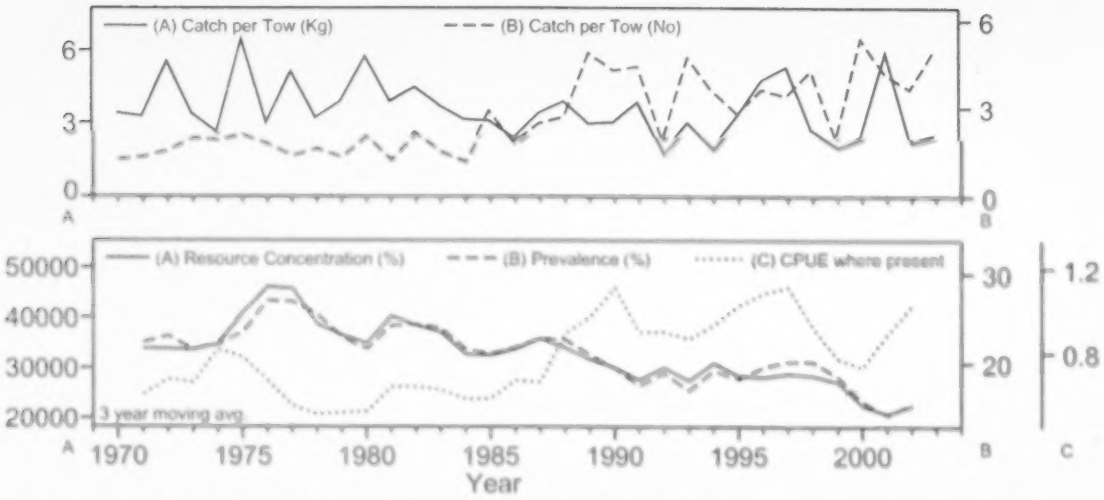


Fig. 89. 4VWX Striped Atlantic Wolffish stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

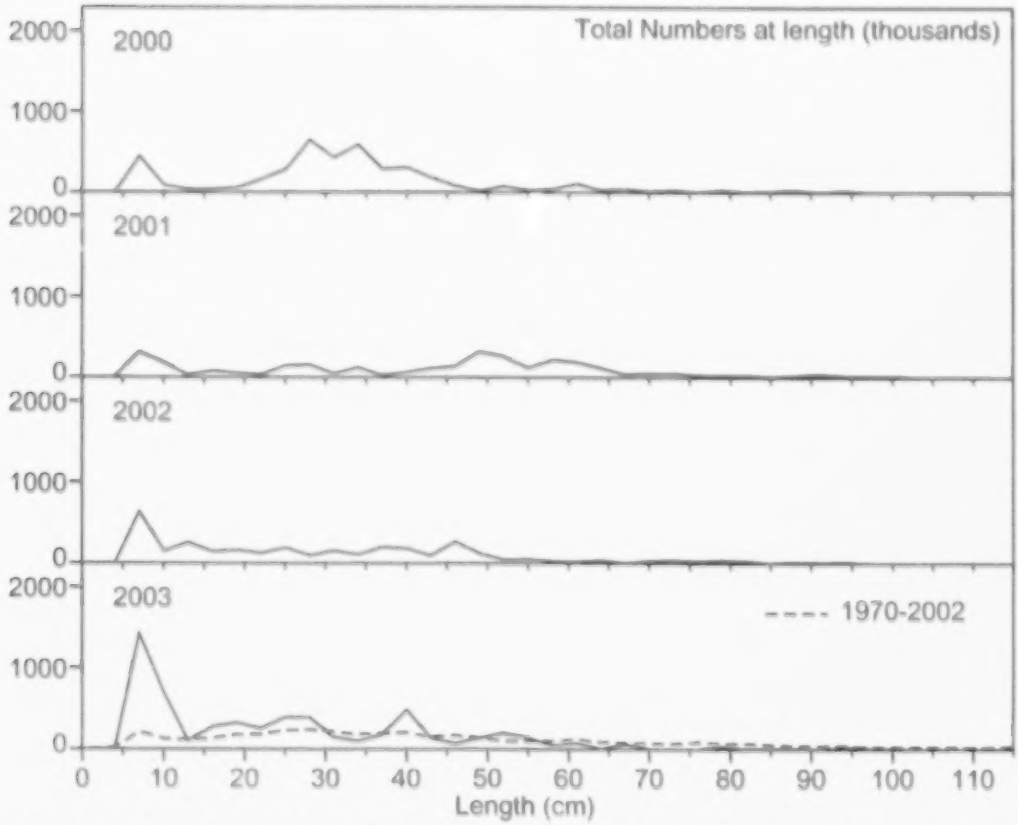


Fig. 90. 4VWX Striped Atlantic Wolffish length frequency distribution from the SUMMER Groundfish surveys

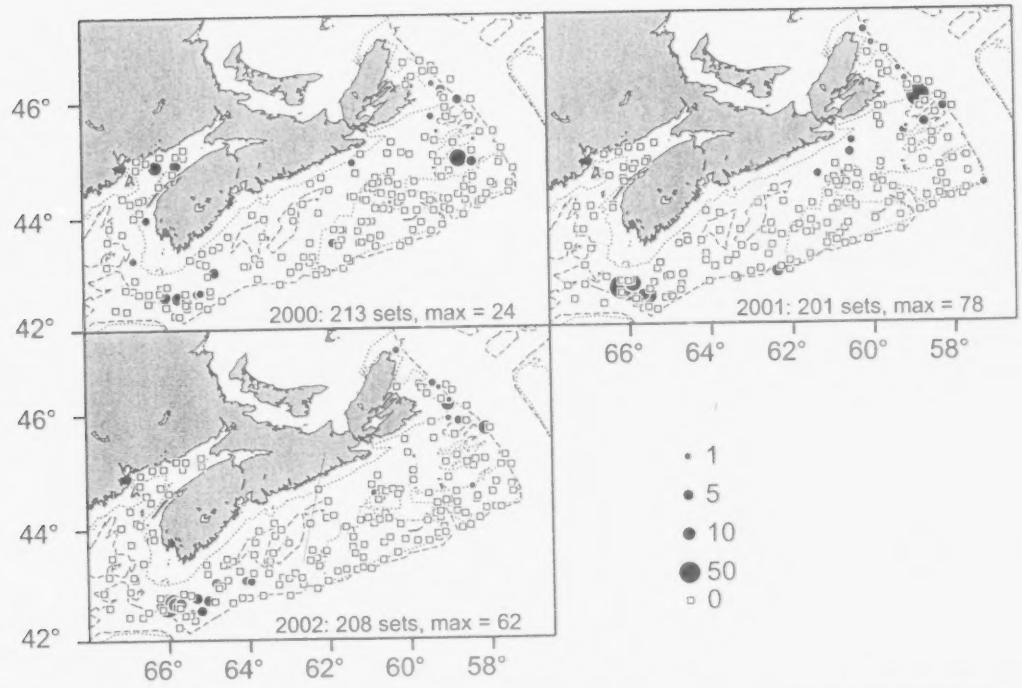


Fig. 91. 4VWX Striped Atlantic Wolffish Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

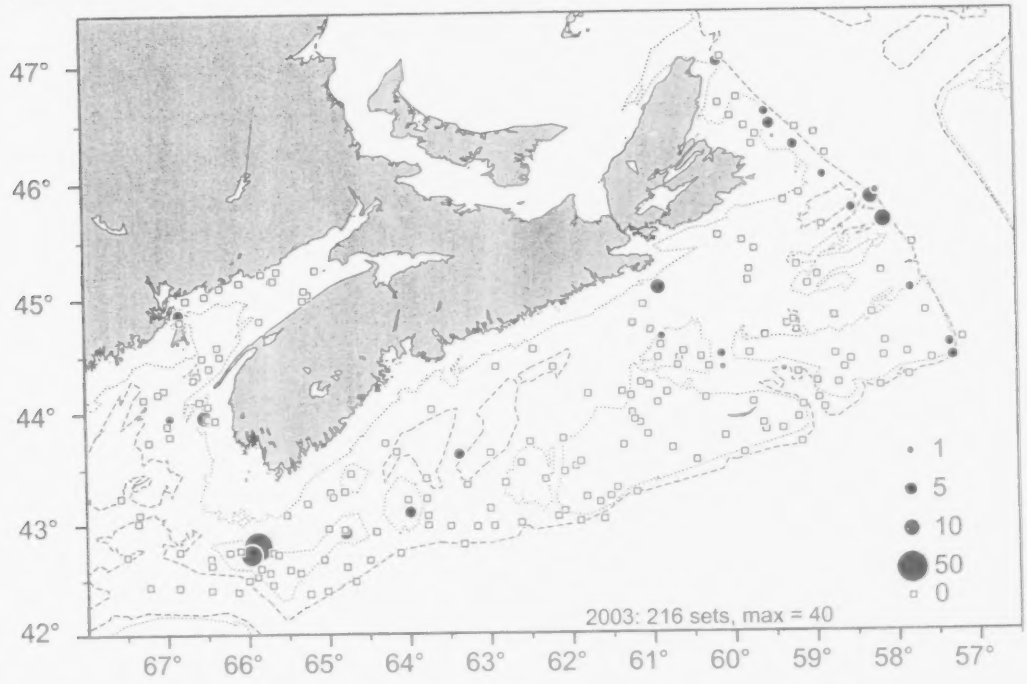


Fig. 92. 4VWX Striped Atlantic Wolffish Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

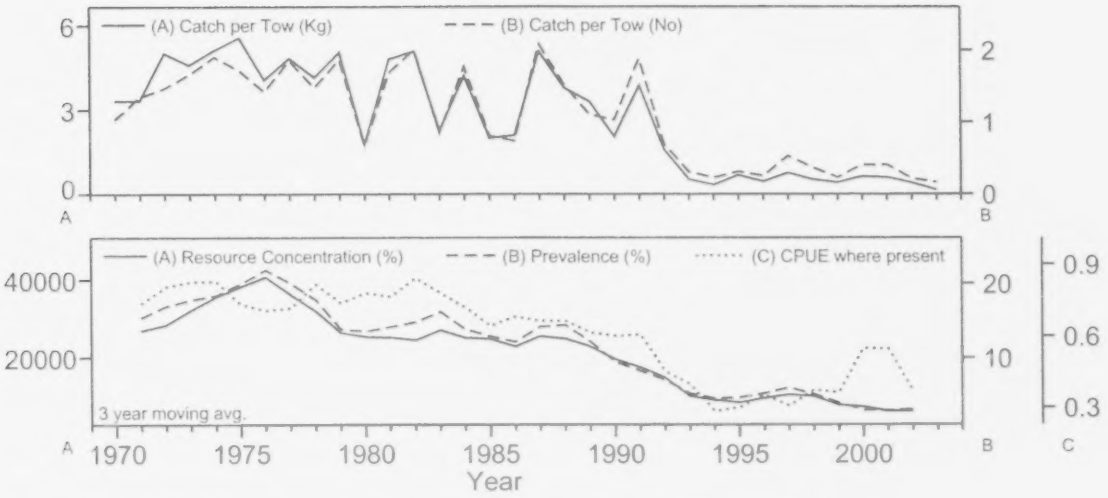


Fig. 93. 4VWX Cusk stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

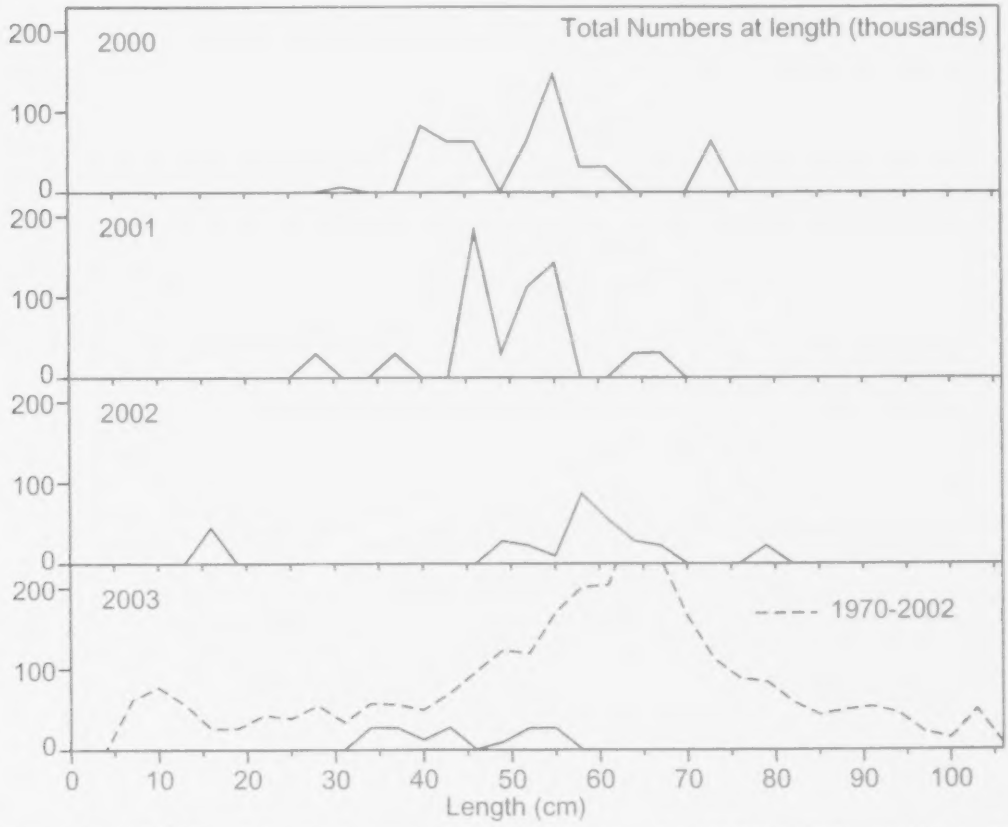


Fig. 94. 4VWX Cusk length frequency distribution from the SUMMER Groundfish surveys.

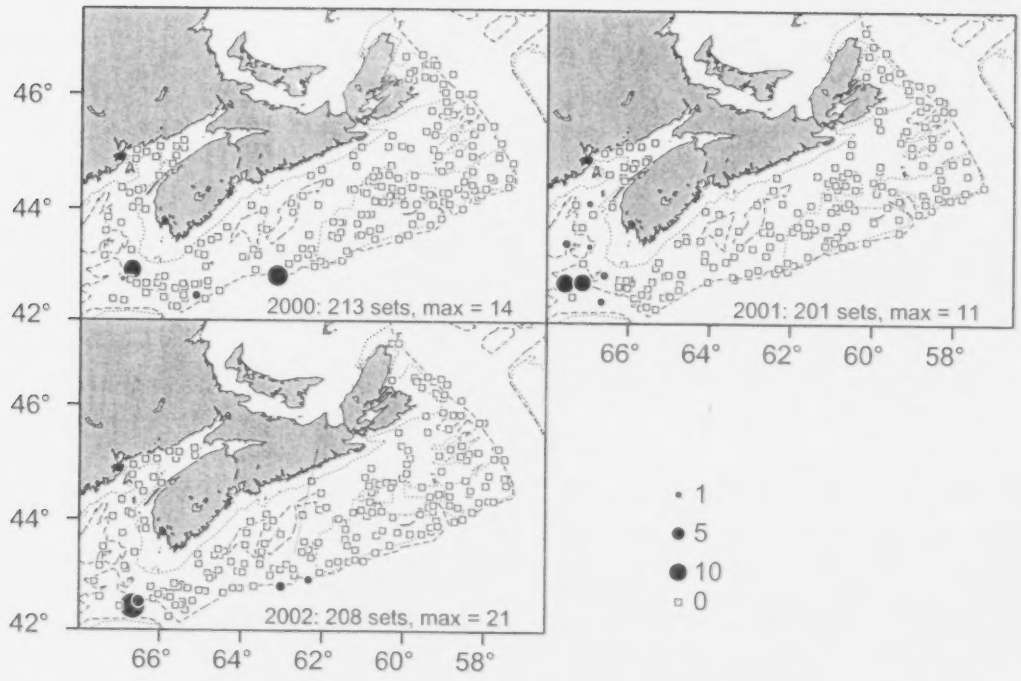


Fig. 95. 4VWX Cusk Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

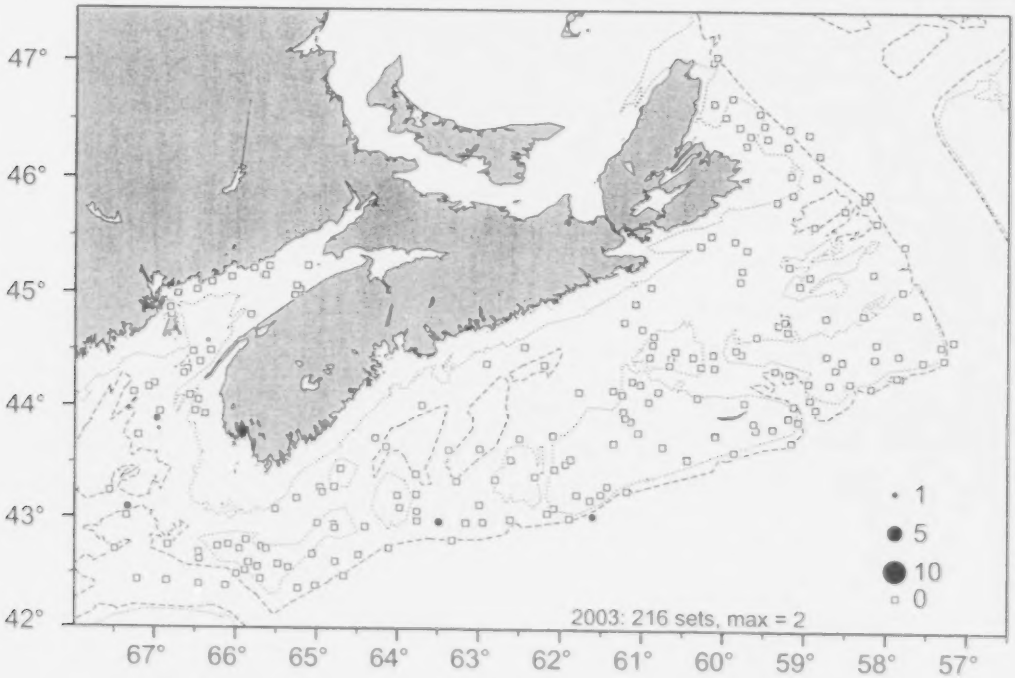


Fig. 96. 4VWX Cusk Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

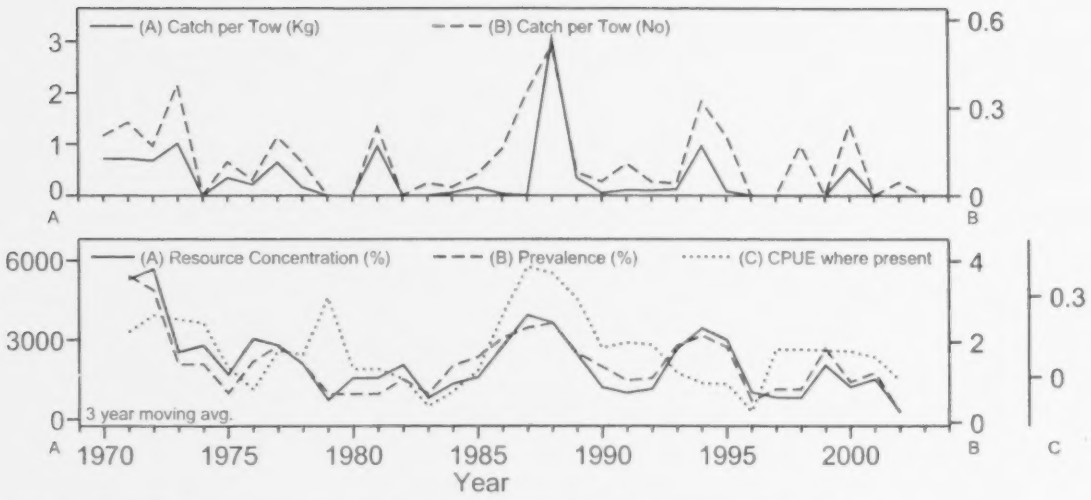


Fig. 97. 4VW Lumpfish stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

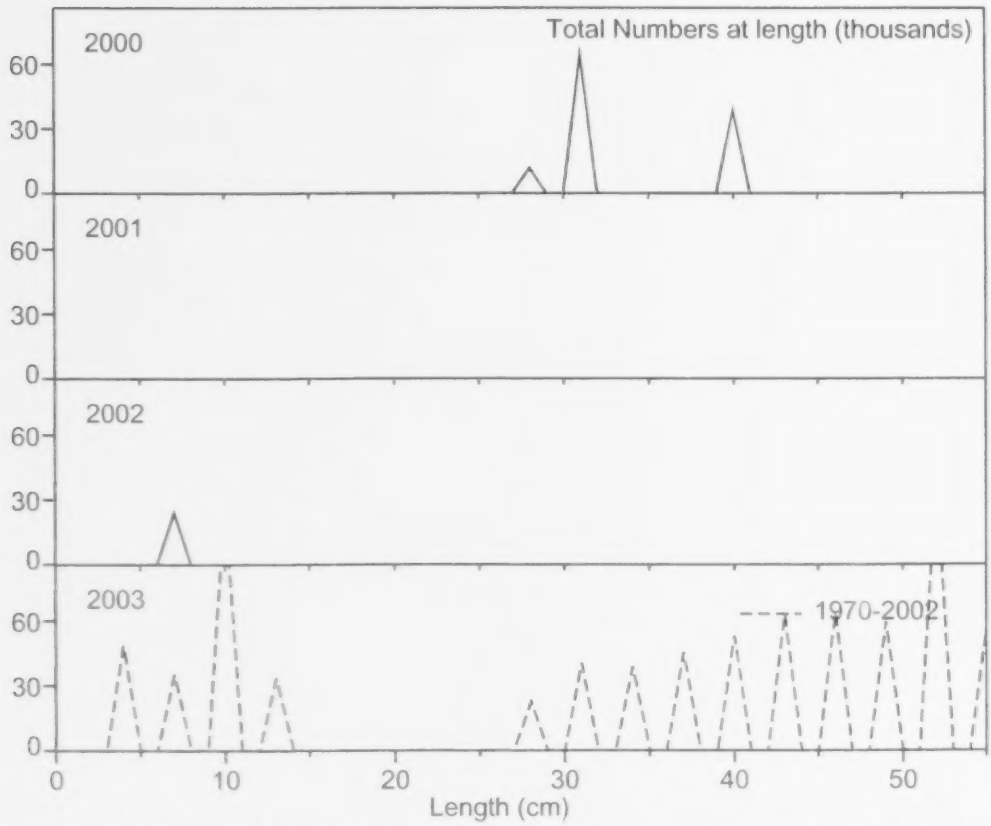


Fig. 98. 4VW Lumpfish length frequency distribution from the SUMMER Groundfish surveys.

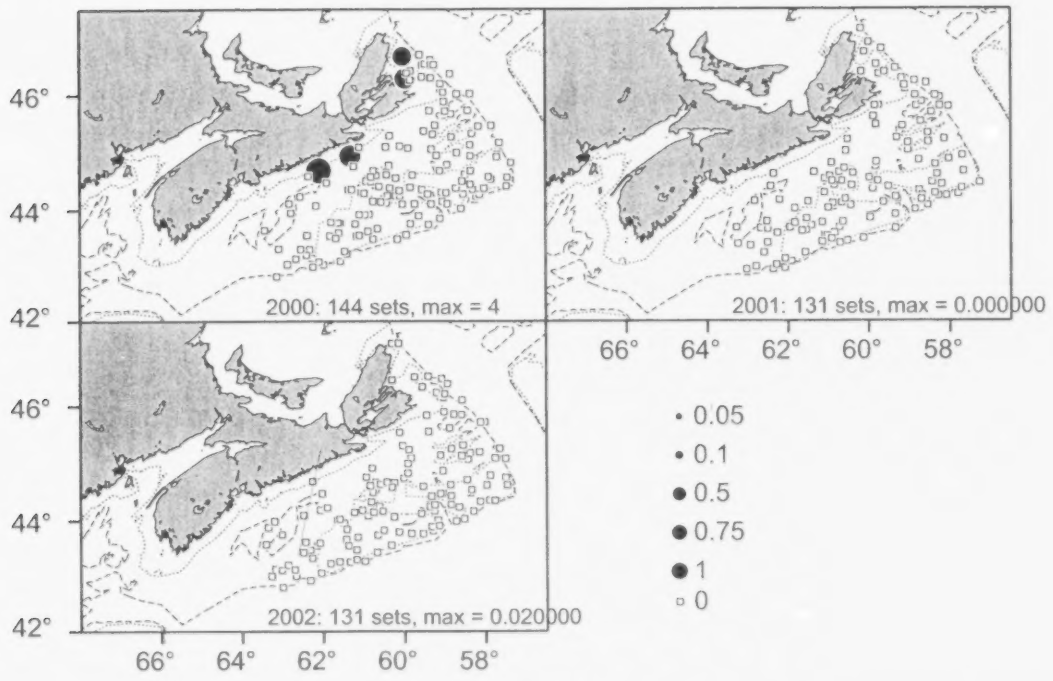


Fig. 99. 4VW Lumpfish Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

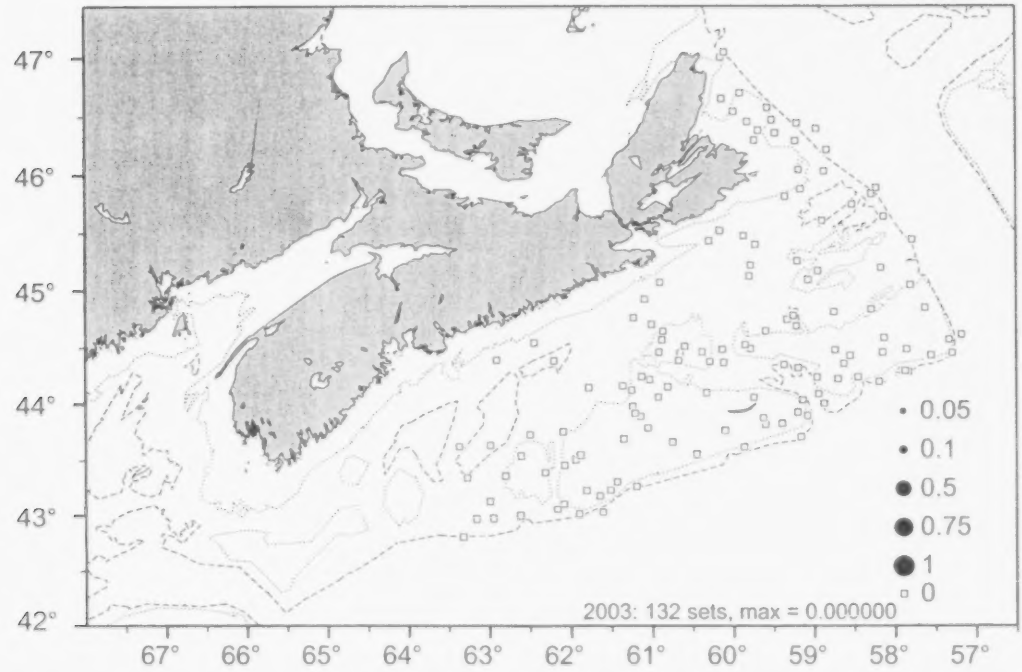


Fig. 100. 4VW Lumpfish Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

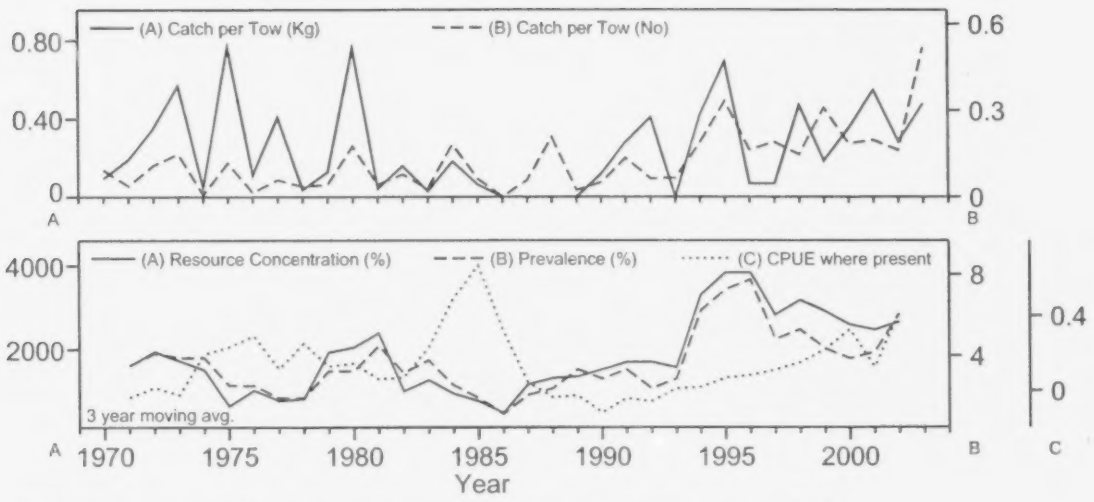


Fig. 101. 4X Lumpfish stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

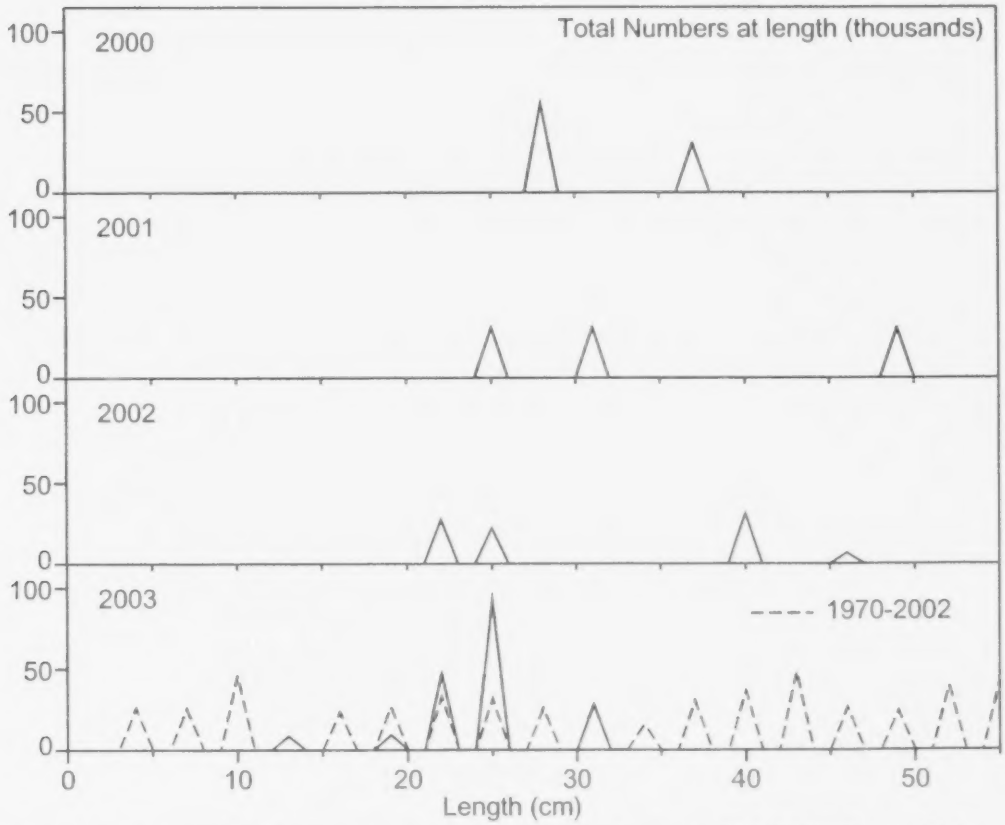


Fig. 102. 4X Lumpfish length frequency distribution from the SUMMER Groundfish surveys.

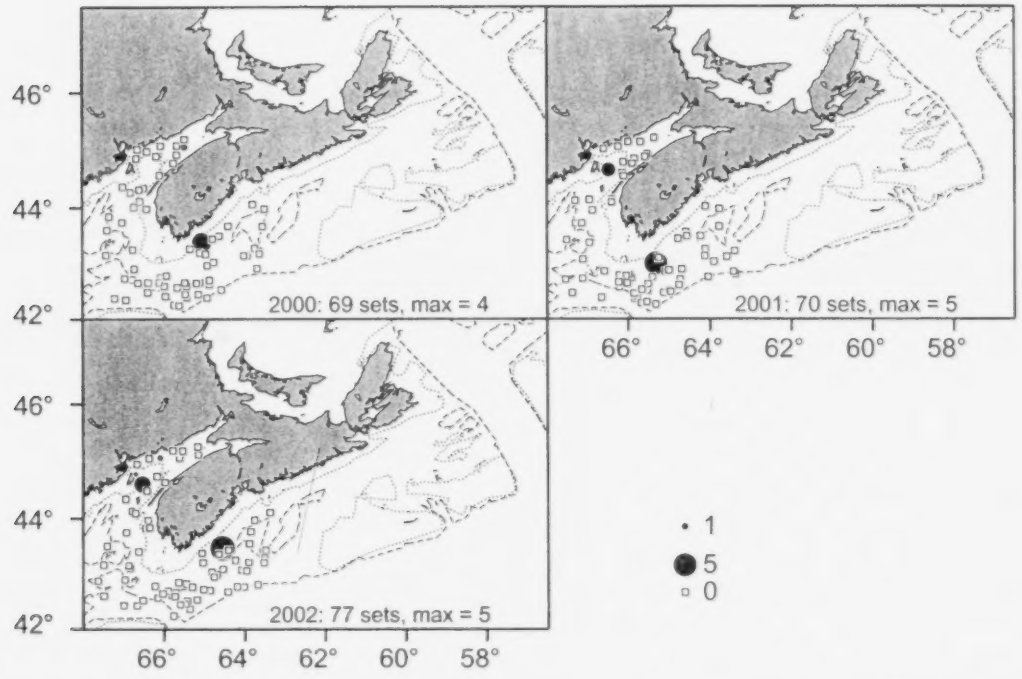


Fig. 103. 4X Lumpfish Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

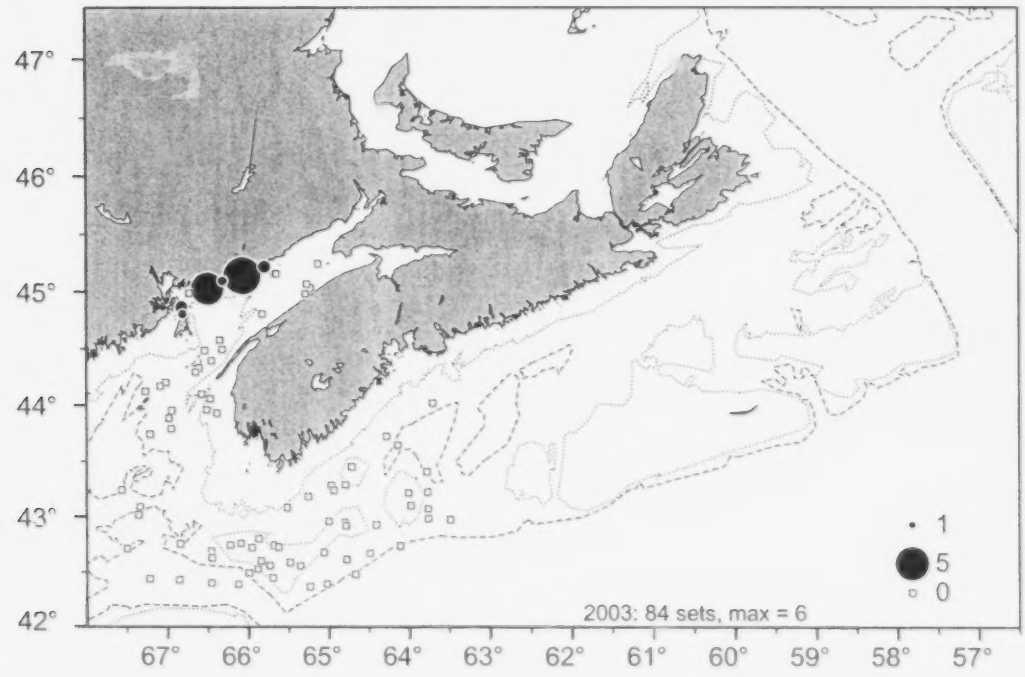


Fig. 104. 4X Lumpfish Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

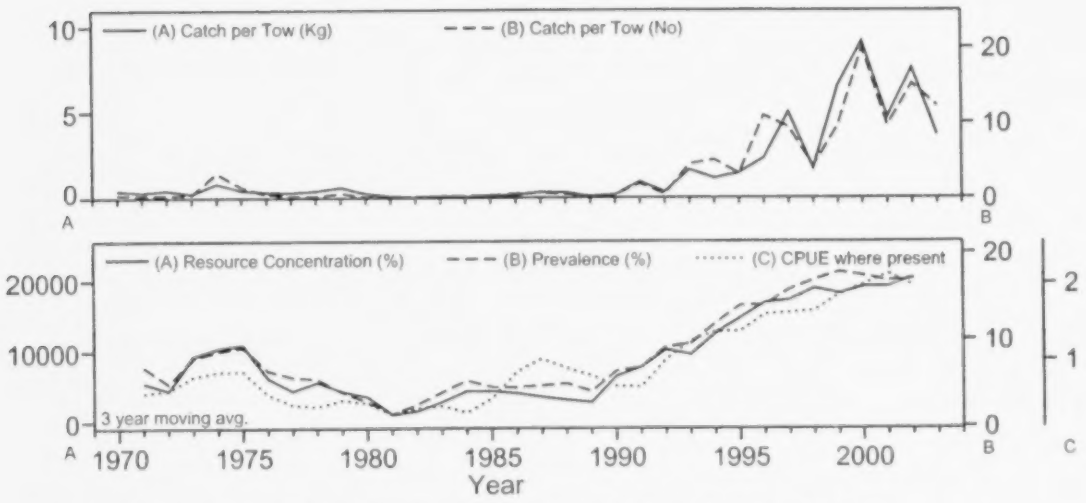


Fig. 105. 4VW Turbot stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

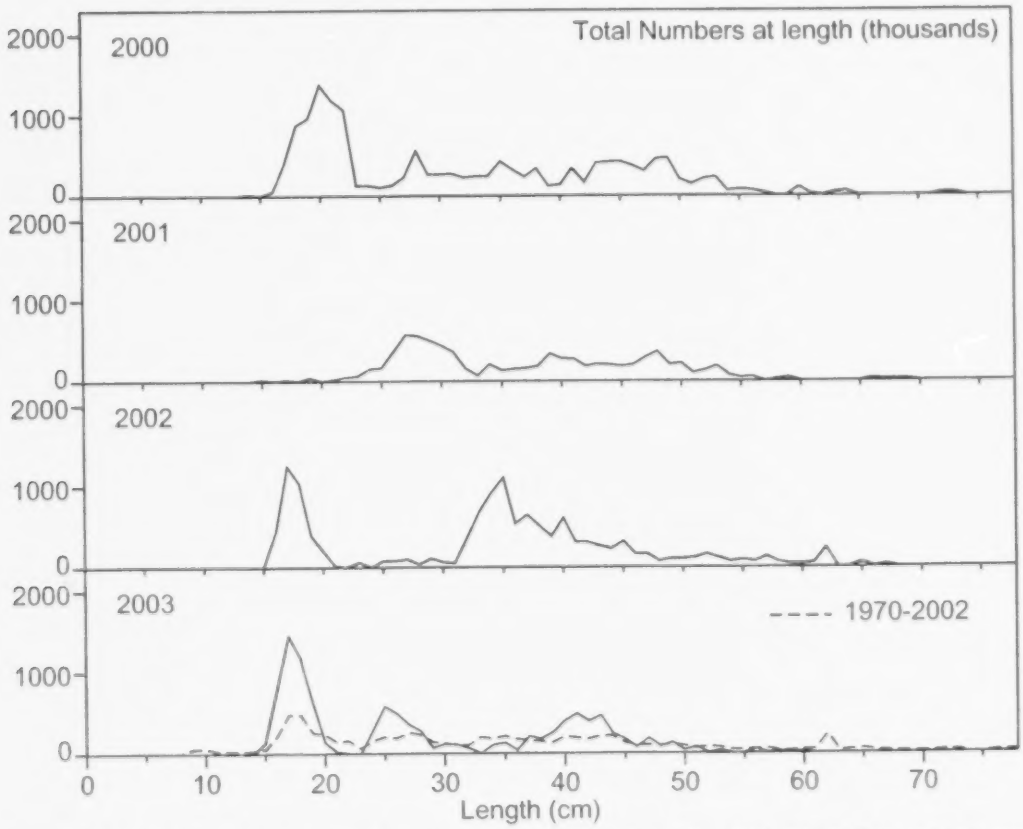


Fig. 106. 4VW Turbot length frequency distribution from the SUMMER Groundfish surveys.

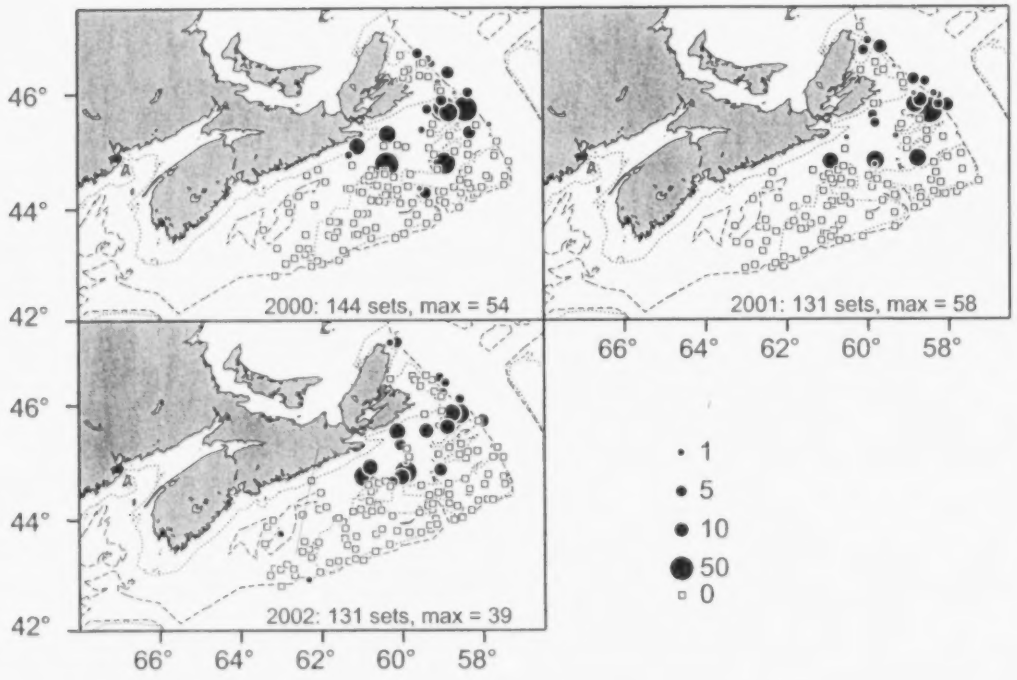


Fig. 107. 4VW Turbot Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

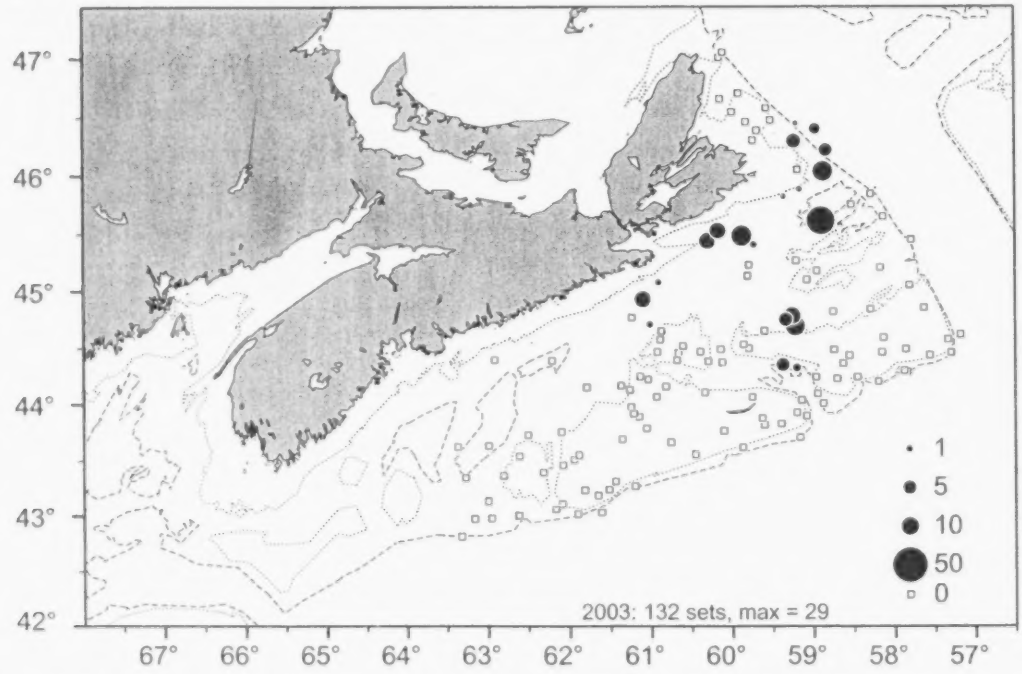


Fig. 108. 4VW Turbot Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.

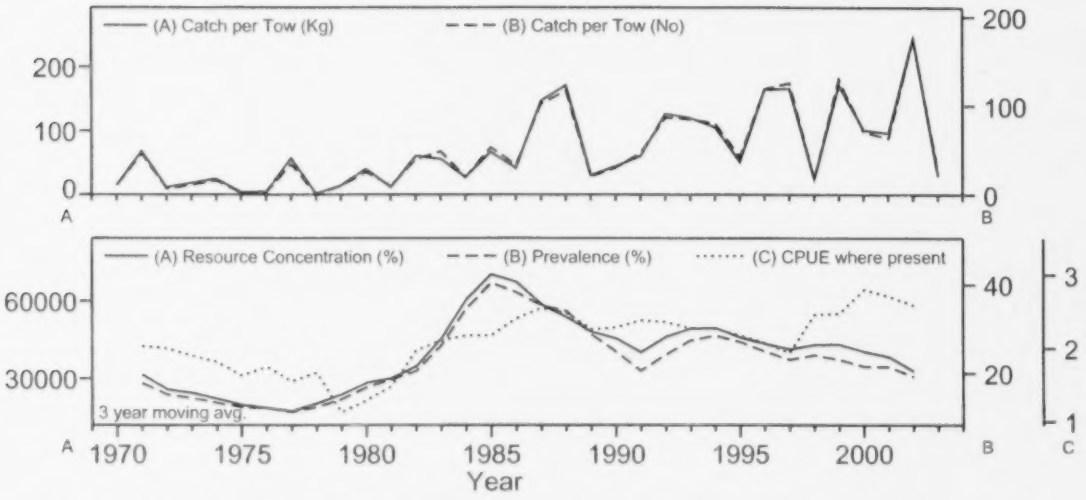


Fig. 109. 4VWX Spiny Dogfish stratified mean weight caught per tow,stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the SUMMER Groundfish surveys.

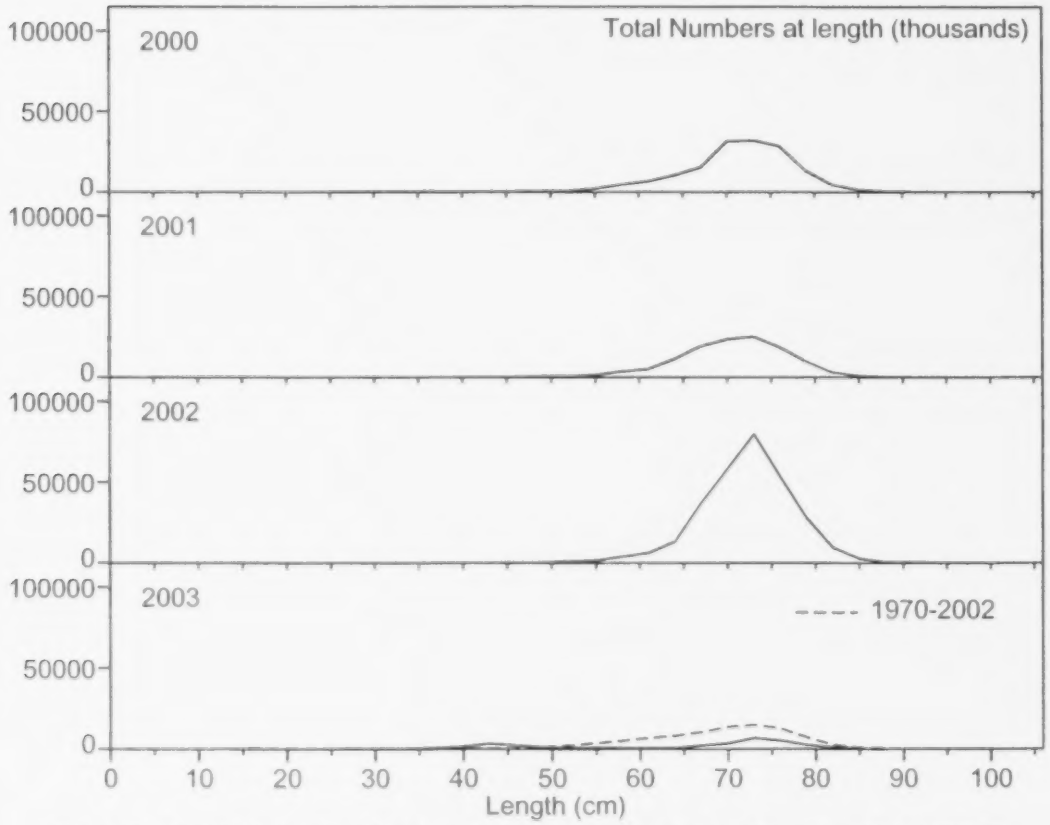


Fig. 110. 4VWX Spiny Dogfish length frequency distribution from the SUMMER Groundfish surveys.

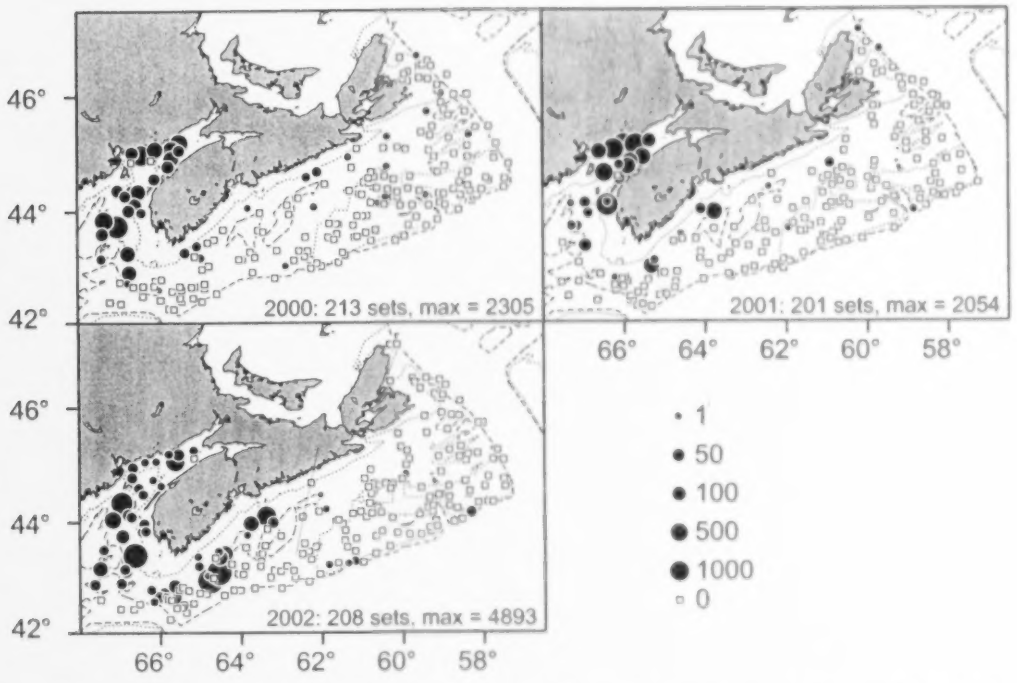


Fig. 111. 4VWX Spiny Dogfish Biomass (kg/tow) from the 2000-2002 SUMMER Groundfish Surveys.

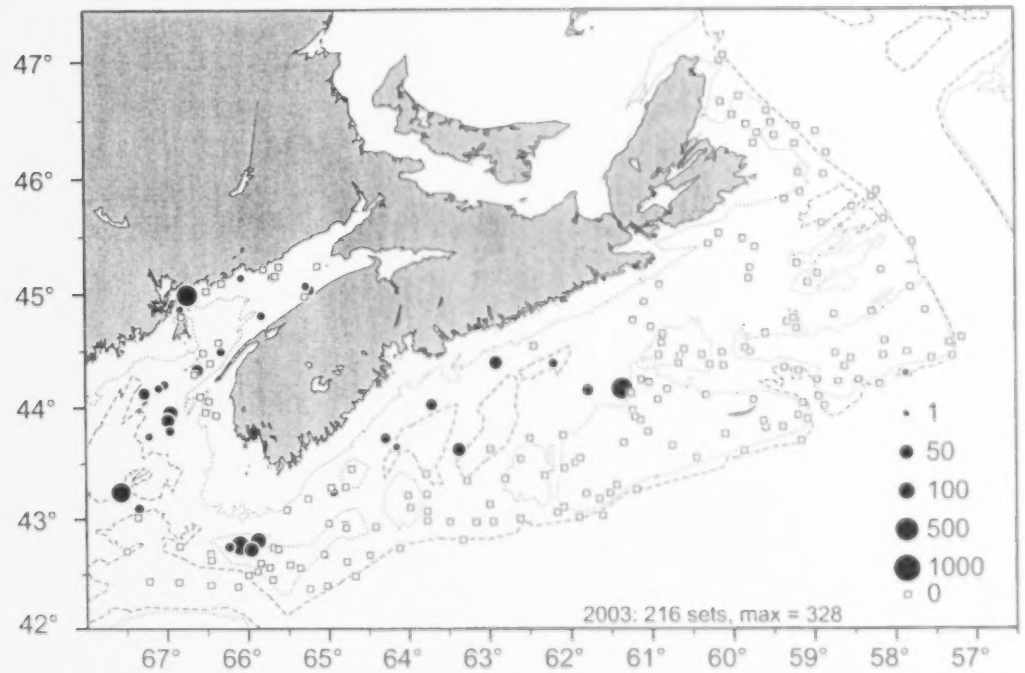


Fig. 112. 4VWX Spiny Dogfish Biomass (kg/tow) from the 2003 SUMMER Groundfish Survey.